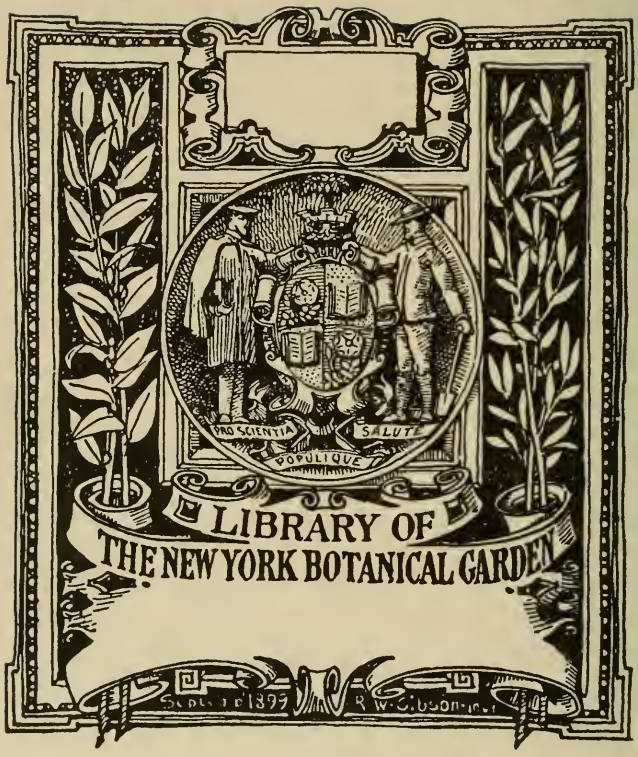
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SECTION OF JEWELL NURSERY CO.'S BLUFF ORCHARD, AT LAKE CITY, MINN. (SEE PAGE 33).

(Top-grafting an apple tree in the foreground).

Trees, Fruits and Flowers

—OF—

MINNESOTA

1917

EMBRACING THE TRANSACTIONS OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY

FROM DECEMBER 1, 1916, TO DECEMBER 1, 1917, INCLUDING THE TWELVE NUMBERS OF "THE MINNESOTA HORTICULTURIST" FOR 1917.

EDITED BY THE SECRETARY,

A. W. LATHAM,

OFFICE AND LIBRARY, 207 KASOTA BLOCK,

MINNEAPOLIS, MINN.

VOL. XLV.

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1917

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While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 JANUARY, 1917 No. 1

Annual Meeting, 1916, Minnesota State Horticultural Society.

A. W. LATHAM, SECY.

The fiftieth annual meeting of the society has now become history. This gathering was held under most auspicious circumstances, everything combining apparently to make the meeting one of unprecedented success in the records of the society. Even the weather was favorable for this purpose, being one of the mildest weeks known in the early part of December in this locality. The attendance was all and even more than anticipated. The badge book, which represents the notification of those who will be present at the meeting, showed 421 names, of which eighty-three were ladies, that being a somewhat larger number than the badge book of 1915 contained.

The West Hotel again proved itself to be an ideal place for our annual gathering, with the exception of course that the various exhibits had to be held in separate rooms, which necessarily interfered with a comprehensive view of what was displayed, thus losing an effect which is of large importance for exhibition purposes. The exhibition, however, was a creditable one, especially the apple exhibit, which filled the two rooms assigned them. There were altogether 499 entries made, of which the larger proportion were for apples. A good many seedling apples were shown, many of them new, and three of them were considered of such importance that an effort is to be made to secure scions from them for testing at the fruit-breeding farm and trial stations. The vegetable exhibit, while of excellent quality, was not as large as last year, probably on account of the extraordinarily

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high price of vegetables, which interfered with the comparative attractiveness of the premium list. The flower show also was not equal to that of a year ago, but enough plants and flowers were displayed to handsomely decorate the hall and rooms so that everybody was satisfied with the general appearance.

Besides the seventy-nine persons whose names appear in the program, a large number of others assisted in various ways in making the meeting a success. We are especially indebted to those who gave their services so faithfully for four days as ushers and members of the reception committee.

The utmost harmony and good will prevailed throughout the meeting. As far as the writer knows not an unpleasant word passed either publicly or privately. One of the choicest features of our gathering is the most agreeable social element displayed in so many ways. The presence of so large a proportion of ladies undoubtedly has much to do with this.

How many were present at these meetings? This is a very difficult question to answer. Many were there for a single session or part of a session who were unable to attend longer, others were there for the whole meeting; several hundred certainly secured some good from this annual gathering. From outside of the state there was an unusual attendance, and every state, including Manitoba, with which Minnesota touches elbows, sent delegates and in most cases several visitors as well, so that there was a large number in attendance from abroad, some of these taking part on the program, and all of them adding increased interest by their presence and the part that they took in the discussions.

Rev. Mr. Harrison, of Nebraska, was with us as usual at the opening session and delivered the invocation. Notwithstanding his advanced years he was able to present with his usual vigor the several addresses for which he was down on the program both at the state meeting and with the newly formed peony society.

With one exception all on the program for Tuesday morning were present and delivered their parts, the missing member being detained at home, but having sent his contribution to the program. Tuesday afternoon the whole program of eleven parts were at hand promptly to perform the service announced. The Tuesday evening session was occupied by the State Florists.

Wednesday forenoon the vegetable program was presented, concluding with a lively presentation of home canning. There

was only one absentee from the program that morning. It held a large audience to the very moment of closing, considerably past the noon hour. Wednesday afternoon session was occupied first with spraying experiences and a discussion of orchard pests by some of the professors of University Farm, the last part of the afternoon belonging to the program of the Garden Flower Society, one of the most interesting branches of work presented at the meeting.

Thursday forenoon is the official session of the society, with its annual reports, all of which, however, were passed for early publication to make room for the seven or eight practical papers on horticulture, which fully occupied the time. The reader would do well to look over again the program of these various sessions, which will be found on page 475 of the report of the society for 1916. It is well worth studying, and especially when you know that all of these papers and the discussions following will be published during the year in the society monthly. Thursday afternoon at the outset there was found place for a presentation of the boys' and girls' club work in Minnesota, and two nice little talks from some of their prize winners. Then followed the election of officers, Pres. Cashman being re-elected, and two new members of the board being elected for the ensuing three years, Mr. Ed. Yanish, of St. Paul, as successor to Langford W. Smith, and H. J. Baldwin, of Northfield, as successor to John P. Andrews, who had served on the board with marked fidelity for twenty-three consecutive years. At this point was presented the names of eight persons, a list which was recommended by the executive board for honorary life membership on account of long and distinguished service with the society as follows:

Mrs. Anna B. Underwood, Lake City; Miss Emma V. White, Minneapolis; Mrs. Jennie Stager, Sauk Rapids; John Penney, Cushing, Wis.; Martin Penning, New Ulm; John W. Murray, Excelsior; P. Clausen, Albert Lea; H. J. Ludlow, Worthington.

The remainder of the afternoon was occupied with the semi-centennial anniversary session, a full program as arranged being here presented—and it seems to me worth while to here reproduce this program, as it needs special emphasis and should again be recorded for permanent preservation. The numbers on this program are likely to be all published in some one issue of our monthly during the coming year:

SEMI-CENTENNIAL ANNIVERSARY SESSION.

J. M. Underwood, Lake City, Presiding.

Song—Trafford N. Jayne.
Some History—A. W. Latham, Secretary.
The Heroes of Minnesota Horticulture—Clarence Wedge, Albert Lea.
Personal Recollections—A. J. Philips, West Salem, Wis.
The Ladies of the Society—Mrs. Jennie Stager, Sauk Rapids.
Greeting from University Farm—A. F. Woods, Dean.
The Minnesota Society and the Northwest—Prof. C. B. Waldron, Agri. College, N. D.
Looking Ahead—C. S. Harrison, York, Neb.
To conclude with a lantern slide talk, "Veterans of Minnesota Horticulture." Slides prepared by Prof. LeRoy Cady.

Friday morning session was given up largely to the plant breeders' auxiliary, and as we had with us all of the leading plant breeders of the Northwest it was a thoroughly practical and profitable session. The reports of the fruit-breeding farm followed by discussions on this appealing subject made up a meeting of unusual interest. The last session of the annual gathering, Friday afternoon, is not to be considered as a weak one, as we always put onto the program of that session as good material as is found at any session of the meeting. As you read again this program you will note that this is the case. A large attendance was present at that session, and when the meeting closed, as late as 5:00 o'clock, after an hour given up to parting talks by many of the members, there were still one hundred in the audience.

I must speak especially of the Gideon Memorial contestants, four of whom delivered orations from the platform. Full particulars in regard to this will be found in the Secretary's Corner of this number.

There are unquestionably many other things worthy of mention in this short account of the meeting, but where so large a number give splendid service to the society it becomes impossible to make personal mention. It is due, however, that I should speak of two of those on the program who came from a distance outside the state, delivering three addresses each without compensation by the society, and whose services were most highly appreciated: Prof. S. A. Beach, Horticulturist at the Iowa State Agricultural College, and N. A. Rasmussen, President of the Wisconsin Horticultural Society, an expert market gardener and an institute worker in his own state.

As usual the climax of the meeting was the banquet, at which 210 sat down. The program follows:

T. A. Hoverstad, Minneapolis, Toastmaster.
Grace—Rev. C. D. Blaker, Minneapolis.

1. Song - - - - - Trafford N. Jayne, Minneapolis
2. S. P. Crosby, St. Paul—"Would You be Happy? Do Something for Us."
3. Whistling Solo - - - Bertha Maud Pratt, Minneapolis
4. Miss Emma V. White, Minneapolis—"A Jingle at Your Expense."
5. Reading - - - - - - - Bertha Maud Pratt
6. Dr. E. F. Clark, Minneapolis—"We Have the Earth—What is Left for the Other Fellow?"
7. Song - - - - Mrs. Grace U. Bergen, Minneapolis
8. Rev. T. E. Archer—"Right Adjustment is the Condition of Success."
9. Song - - - - - - - Trafford N. Jayne
10. Rev. John M. Walters, St. Paul—"The Fun of Being a Farmer."
11. Reading - - - - - - Bertha Maud Pratt
12. N. A. Rasmussen, Pres. Wis. State Hort. Society, Oshkosh—"Keep Smiling"—Why Not?
13. Song - - - - - - - Mrs. Grace U. Bergen
14. Rev. C. D. Blaker, Minneapolis—"Friends Must Part, but We Meet Again."
15. Song - - - - - - - - "America"

Some of our membership do not succeed in getting out to this annual banquet. If they want to know just what they miss, consult those who do come, and plan to be with us at this annual feast another year.

The premiums awarded at this meeting amounted to $596.27, details of which may be found in another place in this number of our monthly.

FRESH VEGETABLES DURING WINTER.—Few people realize the number of vegetables that may be kept in the fresh state for winter use.

The essential conditions for the storage of all root crops, including such vegetables as potatoes, beets, carrots, horseradish, parsnip, winter radish, rutabaga, salsify, turnip, kohlrabi and also cabbage, are that they be kept cool and moist, away from air currents. Storing should be done as late as possible, avoiding freezing.

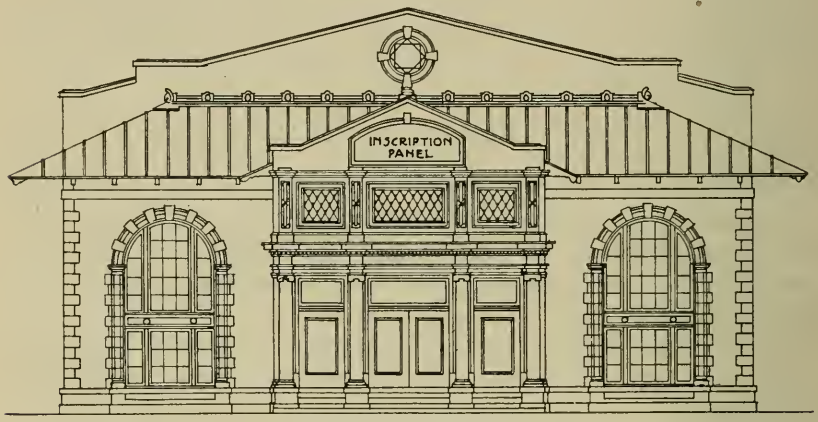
These conditions may be met in several ways. The simplest for home use, where only a few of each are to be stored, is to place them in a box of moist sand or soil in layers and leave in a cool part of the cellar.

Where larger quantities are to be kept, they may be put in what is known as an out-of-door pit. Only whole specimens free from disease should be used. The method is as follows: The vegetables are placed in a conical pile on the surface of the ground in a well-drained location. A covering of six to eight inches of straw or litter is then placed over them, and a covering of as much soil, commencing at the bottom and working toward the top. In severe climates a later covering of manure may be necessary as soon as the soil freezes. In this way, vegetables may be kept in perfect condition until well along in the spring.—J. J. Gardner, Col. Agri. College.

Building Proposed for Minn. State Hocticultural Society.

A. W. LATHAM, SECY.

At the annual meeting two years ago a committee was appointed to urge upon the legislature the importance of a building for the uses of the society and do everything possible to secure its erection. Our membership are familiar with the fact that a strong effort was made for this purpose, but on account of the prevailing sentiment in favor of stringent economy at that session it was finally decided, with the advice of members of the



FRONT ELEVATION
Scale 8 Feet

PROPOSED HORTICULTURAL HALL
FOR THE
MINNESOTA STATE HORTICULTURAL SOCIETY

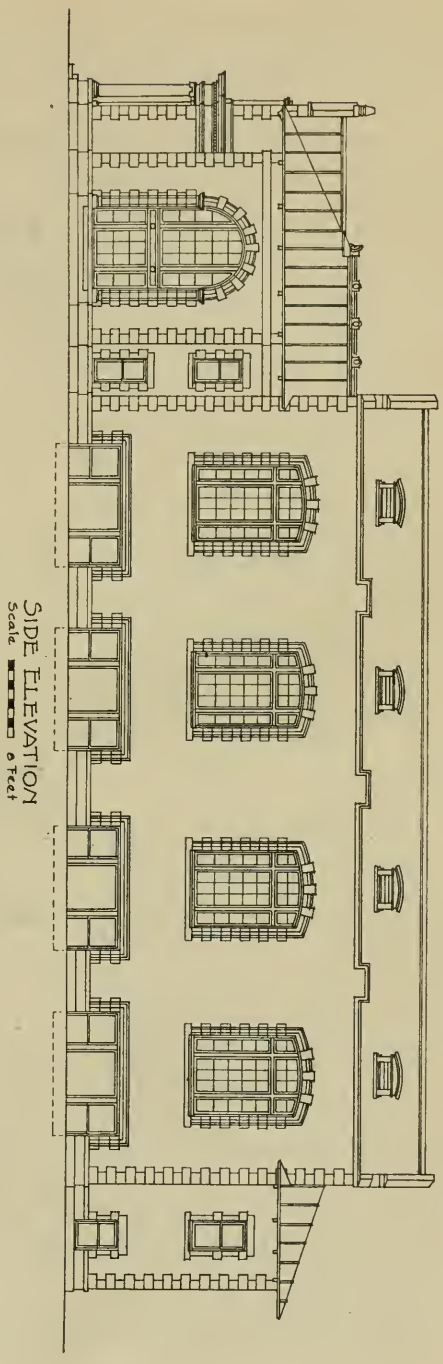
legislature who were giving special attention to this matter, to hold the vantage ground gained by the presentation of the case which had been made by the building committee and allow it to rest until the next session of the legislature.

At the late annual meeting of the society the building matter was again considered, and the building committee continued with instructions to endeavor to secure the necessary appropriation from the coming state legislature. This committee consisted of J. M. Underwood, of Lake City; S. P. Crosby and E. Yanish, of St. Paul; President Cashman and Secretary Latham. Since then S. A. Stockwell, of Minneapolis, has been added to the committee.

Plans for the proposed building were drawn two years ago, which are again reproduced in this article. The building is to

contain all of the features that seem to the committee to be desirable, and to be equally well adapted to the uses of the auxiliary societies as to those of the state society.

The proposed building, as noted in the plans, is 119 feet long and 66 feet wide. It consists of two stories, the first one of which is in the nature of a high basement, the floor being three feet below the ground level. This floor is to be used for an exhibition room. The room is twelve feet high and sufficiently large so that all the exhibits of various classes made by the society can be shown in this one room at the same time. It is sixty-four feet wide by eighty feet long and has a driveway in the rear so that teams can be driven directly in on the floor when necessary in unloading heavy articles. On the ground floor at the front there are provided the necessary toilet conveniences and two large rooms which may be used for committee rooms or storage purposes. In the rear is located the furnace, coal bins and in one corner a stairway leading up into the auditorium above. The building is so arranged that either of the



two front rooms provided in the basement could be fitted up for a kitchen and made available for banquet purposes if at any time societies using the building should have need of such accommodations.

The upper or main floor is approached from the front by a marble staircase, eleven feet wide, opening into an auditorium the same dimensions as the exhibition room below, sixty-four by eighty feet, and sufficiently large to seat comfortably, with wide aisles, in accordance with the requirements of Minneapolis building ordinance, eight hundred people. This room is abundantly lighted. The side walls are sixteen feet high, but in the center the ceiling is twenty-two feet high, the difference in elevation being on account of the curve of the iron trusses which support the roof, there being no posts in this room to obscure the vision.

The platform is ten feet deep and constructed in the usual manner in the rear of the building. On this floor, at the front, are also the secretary's office, library, cloakroom, closets, etc., an entirely convenient arrangement for the use of the officers of the society. The floors are concrete, and in fact the building itself is thoroughly fireproof throughout and planned to be a handsome building and finished in the highest style of art needed for such a structure. The walls are mainly of brick, the corners being cut stone, etc., the roof is of slate. As noted by the illustrations it is a building of the appearance of which the Horticultural Society may well be proud.

The building committee has already at this date, December 19th, held meetings with the Board of Regents and Civic & Com-

merce Association, Minneapolis, and is working in other directions to advance this project. Very early in the session of the legislature a bill will be presented, probably the same that was presented last year, a copy of which will be found at the conclusion of this article. There will be the usual hearings before the various committees, and before these take place it is hoped that the membership will take opportunity to either see personally the members of the House and Senate from their districts, or write them personal letters urging their support for this building, of which the Horticultural Society stands so much in need.

There was a very strong sentiment in the last legislature in favor of this building, and we have much reason to hope that the efforts to be put forth this winter will be crowned with success if we can have the support of the membership, of which their loyalty in the past to any interest connected with the society gives us full assurance.

Of course the building committee is not tied down to this or any other particular plan, but the one presented here seems to combine all desirable features, though it may seem best later to make some changes either in the ground plans or elevation. Those of our membership who have copies of the report of our society for 1915 are referred to pages 124 and 83 of that volume, where the general situation in regard to the building and its needs are very fully presented.

Here follows a copy of the bill to be presented to the legislature for passage.

An act providing for the construction of a building for the uses and purposes of the Minnesota State Horticultural Society and appropriating money for the same.

Be it enacted by the Legislature of the State of Minnesota:

Section 1. There is hereby appropriated the sum of $50,000 for the construction of a Horticultural Building for the uses and purposes of the Minnesota State Horticultural Society and the purchase of a site upon which to erect said building, the same to be located at a point midway between Minneapolis and St. Paul on or near the grounds of the University Farm or on or near the grounds of the Minnesota State Agricultural Society, the location to be determined by the executive board of the Minnesota State Horticultural Society jointly with the Board of Regents of the State University if located on the ground of the University Farm, or jointly with the executive board of the Minnesota State Agricultural Society if located on the grounds of the last named society. The executive board of the Minnesota State Horticultural Society shall select the site if the building is not erected on the grounds of either the University of Minnesota or

of the Minnesota State Agricultural Society,—said building and site to be the property of the State of Minnesota.

Section 2. Power is hereby granted to the Board of Regents of the University of Minnesota and to the executive board of the Minnesota State Agricultural Society to contract with the executive board of the Minnesota State Horticultural Society for the erection of said building on the grounds of the University of Minnesota or on the grounds of the Minnesota State Agricultural Society, respectively, and for the management and control thereof.

Section 3. Said building shall be constructed by the Board of Control according to plans and specifications to be provided by the executive board of said Minnesota State Horticultural Society, and when completed shall be under the administration and control of said society for the purposes noted; provided, if said building is located on the grounds of either the University of Minnesota or Minnesota State Agricultural Society the management and control thereof shall be determined between the respective parties.

Section 4. Should said site be provided by gift or otherwise then all of said appropriation shall be available for the construction of said building as aforesaid.

Section 5. This act shall take effect and be in force from and after its passage.

"THE CANADIAN POPLAR is distinctly different from the Norway or the Carolina. The two latter are very similar. The vein in the leaf of the Carolina Poplar is red. Of the Norway Poplar yellow or light pink. Their wood when dormant is very similar, the bark being gray and corrugated. The leaves are flat, the edges slightly notched, but the leaf of the Canadian Poplar is curly, the edges crinkle. As you look across them, when they are growing, it is very noticeable and would attract the attention of the ordinary observer. The veins of the leaf are generally yellow or pinkish, shading into yellow. The bark, however, is green and smooth. It is a little slower growing than the Carolina or Norway Poplar. It is more hardy, as numerous testimonials from the Dakotas and other locations in the northwest prove. The top has a well developed head, but the growth of the tree is not so rapid that the head will be too heavy for the body and the winds break it down. It is equally as hardy as the Cottonwood, with a more attractive foliage and a more shapely well branched top. This tree is the only one that is sufficiently hardy and resistent to cold extremes and sulphur fumes to warrant its planting at Butte, Mont. In that city it is planted extensively and no other tree seems to take its place. Any trees that will live at Butte, Mont., will grow almost anywhere in the world."—E. A. Smith, Jewell Nursery Co., Lake City.

The Fifty-First Annual Convention of the Iowa State Horticultural Society.

MRS. E. W. GOULD, MINNEAPOLIS, DELEGATE.

Iowa may well be proud of its Horticultural Society and of its splendid exhibit of apples, pears, grapes and nuts recently shown in the State Capitol at Des Moines.

Its rooms in this building are handsome and commodious, much like a large private library, where were easily accommodated the average of about fifty who were in attendance. Here the sessions of its annual meeting were held December 12, 13 and 14. Just outside its doors in the rotunda of the capitol was staged the exhibition of fruits and nuts.

Some of the many interesting papers and discussions were upon "Renewal Pruning to Promote Bearing," "The Family Garden," "The Past, Present and Future of our Native Plums," "Our County Agent," "Spraying and Cultivating," "Fall vs. Spring Planting," "Orchards of Wisconsin," "A System of Parks, National, State and County," "The Oaks," "Some Native Shrubs," a fine talk by our own Prof. Cady; "Conservation of the By-Products of the Orchard," "Forty Years Rose Growing in Iowa," "The Peony," "The Mission of Beauty," by Iowa's poet, Mr. Eugene Secor of Forest City; "Records of Fall Bearing Strawberries for 1916," "Evergreen Windbreaks," "Arrangement of Farm Buildings and Grounds"—all of which awakened lively interest and warm discussions.

On Wednesday afternoon a speaking contest by six students of the Horticultural Department of the State College at Ames and selections by a male quartette from Iowa State College made up a very popular program, much appreciated.

The exhibit of apples consisted of over four thousand plates of apples and about two hundred boxes. Words fail to describe the beauty and fragrance of these. A few pears were shown, also grapes and nuts.

That Iowa and Des Moines are awakening to the importance of this exhibit and meeting is shown by the fact that committees from the Greater Iowa Commission and the Commercial Club of Des Moines waited upon the convention, bringing an invitation and proposition that they hold their 1917 meeting in their Auditorium down in the center of the city and combine with the State Florists and Gardeners to make an exhibit that will be much more accessible to the general public. They felt that such

an exhibit should be seen by every man, woman and child in the city. Each day of the convention I saw classes of pupils from their high schools studying the exhibit or listening to some demonstration by one of the college professors. This struck me as a very fine thing, an idea that we might adopt with profit.

The Commercial Club entertained the convention Tuesday evening at a theater party, and on Wednesday evening the annual banquet was held in a beautiful tea room. This was largely attended, the dainty menu and the eloquent and witty toasts combining to produce a most perfect evening.

I found Des Moines a very beautiful city, with the beginnings of a Civic Center, that, if carried out, will make it famed throughout our country, and its people, and those from the different parts of the state, earnest, progressive and the kindest ever. Much credit is due Mr. Wesley Greene, the secretary of the Horticultural Society, for the very fine programs and general arrangements, contributing so largely to the success and pleasure of the meetings, and also to its cultured and genial presiding officer, Mr. W. B. Chapman.

INSECT ENEMIES OF ROSES AND HOW TO COMBAT THEM.—In the path to easy success with roses lie numerous insect pests which, unless prevented, will devour leaves or suck juices, thus seriously impairing the vitality of the plants. The only way in which the rose gardener may prevent these attacks is by careful and insistent spraying with insecticides.

Insects which most commonly affect roses, according to specialists of the U. S. Department of Agriculture, are of two general types, those which eat the foliage, as rose slugs and the rose chafer, and those which suck the sap, as aphids, scale insects and thrips. The presence of leaf-eating insects is usually first detected through the discovery of partially eaten leaves or of skeletonized leaves; that is, leaves from which a portion of the lower or upper surface has been eaten, leaving the other surface as a transparent membrane, or leaves the fleshy part of which has been eaten clear through, often leaving merely the midrib and veins. The discovery of the enemy frequently follows. Protection from this sort of attack is afforded by hand picking or by covering both surfaces of the foliage thoroughly with some poisonous substance, as arsenate of lead. Wherever a garden hose is available, a strong stream of water directed against rose slugs on the foliage will knock them off and, in many cases, save the bush from further injury by them. The rose chafer is a rather difficult insect to control, and arsenical poisons applied at double the usual strength often fail to kill them before the damage is done. Frequent hand picking of the beetles and dropping them into a vessel containing water covered with a film of kerosene, or screening the plants with mosquito netting, especially the latter, often affords the only means of preventing their destructive work.—U. S. Dept. of Agri.

Winter Meeting of the Wisconsin State Horticultural Society.

J. F. HARRISON, EXCELSIOR, MINN., DELEGATE.

The annual meeting, 1916, was held in the senate chamber of the beautiful new capitol building, which is just being completed at Madison, Wis.

The exhibits were arranged around the outside of the balcony, or corridor, which runs around the center of the building, and it was a fine exhibit of all kinds of apples and vegetables, which certainly were a credit to the Wisconsin fruit growers and a great advertisement for the state. One exhibit which was of especial interest and attracted a great deal of attention was made by one of the ladies, and her exhibit consisted of apples served in fifty-seven different ways. An exhibit of this kind gives one some idea of what an orchard means to every farmer and his family.

The program was very interesting and very instructive, very much like our Minnesota program, but I believe I got much more out of it, and the reason for this was I did not have so many of my friends to visit with, consequently I got the benefit of the whole program.

The papers and talks on orchard diseases were some of the best I ever heard. They certainly have men who are well up in the business of fruit growing in Wisconsin, and I do not think there is any danger of orchard diseases getting possession of the orchards there.

I noticed their professors are not only professors but are practical fruit growers as well.

They also have a lot of young students who will be able to take care of the fruit industry and combat the diseases which may attack the orchards and will keep the horticultural society alive when its affairs are turned over to them.

I think the students' contest was one of the best I ever heard.

Making my report as short as possible, I will say the meeting was so very good I want to go again. The Wisconsin State Horticultural Society is hard to beat and the members are all the same good fellows as our own.

A Young Top-Worked Orchard.

E. G. LEE, ST. PAUL.

The theory and practice of top-working have been thoroughly discussed before this society, and its purpose and advantages are well known. In relating the results of my efforts along this line, my purpose is merely to show how I have applied the principles of horticulture learned from the experience of others. I have obtained this information from many sources, studying the subject carefully for several years, but to the Minnesota Horticulturist I am chiefly indebted for both knowledge and inspiration, and to Mr. Harold Simmons, of Howard Lake, for practical advice.

In establishing a top-worked orchard, the problems faced might be classified under six heads: 1. Selection of a site. 2. The selection of the stock. 3. Planting. 4. Selection of scions. 5. The grafting operation. 6. Care of the orchard.

My land is in the Minnetonka district, about one-half mile from the Tonkawood station on the Deephaven trolley. To the southwest is Christmas Lake, directly west is the main lake of Minnetonka, and just north is Gray's Bay. Between these bodies of water and my property is an extensive growth of heavy timber, so that my trees are protected from the hot southwest winds of summer and from the cold northwest winds of winter.

The land is rolling with a prevailing north and west slope. The highest point is seventy feet above the lowest, which gives plenty of air drainage. The big lakes and nearby swamps afford moisture content. The soil is virgin hard maple land, part of it cleared just before planting. There is a light loam on top, which does not bake, and a heavy clay underneath.

In the spring of 1912 I planted eleven of my eighteen acres with young trees. I chose chiefly Virginia crab stock, but as I had difficulty in getting the number of trees of that variety I required, I used about 100 Hibernal, which I placed in a block by themselves. There are advantages in both these stocks. The Virginia has a very hard wood and probably provides stronger crotches. It throws out new branches more vigorously than the Hibernal, which would seem to indicate greater vitality, but its branches have a slight tendency to grow in. The Hibernal has a more spreading habit, which is a great advantage in placing scions properly.

I could find only two nurseries in the state at that time with

Virginia crab trees growing on their own grounds. I took all the good trees they had.

At tree-digging time in the fall of 1911 I went into the nurseries and made my selection personally. I did not pick one in ten of the trees which I found in the nursery. There is considerable difference in the size of trees of the same age as they appear in the nursery row. There is a reason for this. Trees differ in individual vitality the same as human beings do. I wanted the most vigorous trees and was willing to pay for them. The trees I paid the most for proved the cheapest in the end.

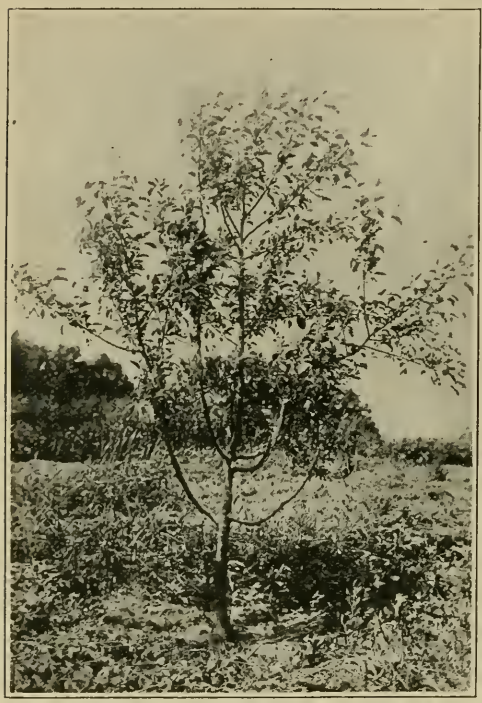
Tree No. 344. Hibernal, set spring, 1915, budded to Wealthy August, 1915. Photo taken July, 1916.

When time would permit I stayed to see my trees dug and placed in the storage cellar, with my label on every tree. This is the only right way to do. The care with which a tree is dug from the nursery row has much to do with its subsequent thriftiness. I have since experimented by buying four and five year old trees, and proved that this can be safely done if the trees are selected and the digging supervised.

By selecting my own trees, I was able to get trees with a proper branch system for top-working. By supervising the digging, I was able to prevent unnecessary mutilation of the root system. I was also able to see whether the trees were infected with root gall and to reject those that were. Most of my trees were dug from the nursery by a crew with spades. This is better than a tree digger if the men are carefully watched. Otherwise there is not much difference.

Now I am thoroughly familiar with the difference of opinion about root gall. Consider all the arguments on both sides, and this fact remains: Root gall is an infectious bacterial disease. A tree may have vitality enough to overcome the disease after having contracted it, but the man who plants an infected tree

takes a big chance. Some trees that were dug after I left in one nursery were infected. I discovered this when I came to plant. I burned about fifty, some with galls as big as my fist. Where the galls were small, I cut them out, disinfected with bichloride of mercury and planted. But these trees have never done well, and I have since replaced a number of them. Where small shoots are seen coming up through the ground around the crown of the tree, root gall will generally be found. It pays to investigate such cases.



Tree No. 78. Virginia crab, top-worked to Jonathan. Photo taken July, 1916.

My planting was done with dynamite. A half stick of forty per cent. was exploded in each hole. The holes were marked twenty-five feet apart each way. The top soil was removed to a depth of about a foot. Then an iron crowbar was driven about two feet into the subsoil, a cartridge placed in the bottom, the hole packed with dirt and the fuse fired. If the cartridge is not placed deep enough, most of the shot will be wasted in the air. After the dynamited hole was cleaned out, the top soil first removed was replaced in the bottom, and the tree set. The trees were taken from my storage cellar and carried about the orchard in a barrel half full of water on a barrel cart. Bichloride of mercury was dissolved in the water, to prevent the spread of any infection from one tree to another.

The cost was about six cents per tree for dynamite. The total cost of planting that way was probably somewhat greater than by the use of a spade alone. But the work can be done very quickly by men who understand handling the explosive.

I have since had planting done by spade, where it was necessary to replace trees, but, of course, in each instance the spot had

been dynamited originally and thus offered no fair basis of comparison. With the great difference in individual trees, a test between the two methods in order to be conclusive would have to be made on a large scale.

It is customary to prune trees after planting. When trees are to be top-worked the following year, this should not be done. All the leaf surface possible should be encouraged the first season, to increase the size of the limbs. If the roots have been cut too much to support this leaf surface, the tree should not be planted at all.

My orchard was interplanted with cultivated crops, and a hoe used around the trees up to the first of August each year.

The first two years after planting the trees were hilled up in the fall, until I found this was not a protection from mice. I now use fine galvanized wire netting instead. I had a number of trees badly girdled before using the netting, and some had to be replaced.

The first two years I painted my trees, trunk and branches with lime-sulphur in the fall. This did not deter mice and rabbits, but I had no blight on my trees the following season, although thorn apple trees near my orchard blighted badly.

The last two years I have not painted the trees, and I have had some blight to cut out. The past season has been the worst, although they have had less cultivation this year than at any previous time, owing to failure on the part of the man who undertook to do the work.

In the spring of 1913, one year after planting, the top-working was started. Some top-working and budding has been done every year since. About one-third of the limbs were top-grafted the first year. W. S. Higbee, of Eden Prairie, did the work, and did it well. The weather was favorable, and only a small fraction of one per cent. of the grafts failed to set.

Three-fourths of my 770 trees were grafted to Wealthy, the remainder to Jonathan and Delicious, changing every fourth row for cross-pollination purposes. I have since planted Stark Delicious trees on their own roots, and they have done well. I have also planted some Wealthy on their own roots for purposes of comparison later. My Wealthy scions came from the bearing orchard of Langford W. Smith. My Jonathan and Delicious scions came from the orchard of Harold Simmons, at Howard Lake, where they were cut from top-worked trees. As an expe-

riment, I top-worked one tree to Northern Spy and one tree to Spitzenberg. The scions were secured through the kindness of Mr. John Bisbee, of Madelia, Minn., who cut them from his own top-worked trees. The Spitzenberg bore ten small apples this season, one year after grafting. All the limbs of this tree were grafted in one operation. The top is noticeably outgrowing the stock.

Tree No. 337. Flanted 1912. Virginia crab top-Grafted to Wealthy. Photo taken July, 1916.

When my trees were planted I photographed several individual trees in different parts of the orchard. Every year I rephotograph these same trees, to illustrate the growth each season. I have here some pictures taken this year, for those who wish to see their present size.

In conducting my orchard operations, I have endeavored to use the same systematic methods as I do in business. All of my trees bear zinc labels, stamped with consecutive numbers, and hung on large rings of heavy wire which will not cut into the bark. An individual record of each tree is kept, and all vicissitudes through which it has passed are noted on the record. Some have been injured in one way or another, by mice, borers, blight, or accident of some kind—all these show on the record to account for the present condition of each tree. I have blue prints, showing not only the contour of the ground, but the exact location of each tree by number. If I wish to replace a tree, I can send a man into the orchard with a blue print showing its exact location.

I do all my own pruning. I always carry a jar of bichloride

of mercury to disinfect my tools, and a can of white lead and raw oil to paint over large wounds. I prune now for wood growth and open centers.

I always hold the spray rod myself. I have a Hays power sprayer, capable of 300 pounds pressure, run with a Cushman engine, especially rigged so it can be belted to the pump jack of the well without removing the engine from the rig when filling the tank. As the trees are not yet in bearing, one spraying in a season is enough. It is applied just at caterpillar time in the spring. I use a combined solution of arsenate of lead, lime-sulphur, and nicotine (black leaf 40). This year it took 150 gallons of solution and one day's time to spray the 770 trees.

I have been at some disadvantage because I do not live on the place. Except for a cement storage cellar in which I lock my tools, there are no buildings on the land. The development of orchards for non-resident owners is not unusual in the Pacific Coast apple districts, but it is rather uncommon in Minnesota. As I can spend only one day a week in my orchard, I have experienced some difficulty in getting my cultivating property done. At first I rented the ground on crop shares. Now I permit the use of the ground free on condition that my trees be hand cultivated. Of course, I plan to live on the place, at least during the summer season, when the trees come into bearing.

One of the conclusions to which I have come is that top-worked trees will be slower in attaining a given size. I have found no other expression of opinion on this point, though it is claimed that top-worked trees come into bearing earlier. It seems to me inevitable that cutting off the limbs for the insertion of scions, thereby reducing the foliage area, delays the growth of the tree. This delay is prolonged wherever scions fail to set, and as the setting is often a matter of propitious weather, there is always a proportion of risk when top-working is done on a large scale. But until the ideal seedling has been found, it must be our main reliance for ensuring hardiness in root systems, and quality and size of fruit.

Before investing in Minnesota, I visited the big orchard projects of the far west, and I bought here, because, in spite of climatic difficulties, I considered it a better field from a commercial point of view, as well as a more desirable place in which to live. My orchard is still in the experimental stage, and while my experience is not yet conclusive, I am more than ever convinced that the outlook for commercial orcharding in Minnesota was never better than it is today.

Mr. Husser: I would like to know whether it is a good plan to dynamite say just a week or so before planting, or if the dynamiting should be done some months ahead so the fumes get out of the ground?

Mr. Lee: I don't think the fumes make any difference, I think they get out of the ground very quickly. I don't think there would be any advantage in dynamiting beforehand. Especially if a rain should come and pack your hole, it might be a disadvantage.

Mr. Husser: Does root-gall spread from one tree to the other in an orchard?

Mr. Lee: That would be hard to tell; I don't think anybody knows. I don't think it does; I think it would be from contact. It might be spread by tools used on a diseased root and then on some other root.

Miss Funk: I would like to know whether scions should be taken from old trees or young trees.

Mr. Lee: The best advice I can find on the subject is to take them from bearing trees.

Mr. Brackett: What advantage, if any, is there in using scions from top-worked trees?

Mr. Lee: I don't know that there is any advantage. I got them because that was the only kind that existed in Minnesota of those varieties.

Mr. Powers: Where you have a tree that you are afraid isn't going to live very long but it may live some years, and you think it would be well to put a new tree near it, would it hurt the roots of the old tree to dynamite not far away?

Mr. Lee: You mean a large tree?

Mr. Powers: Yes, sir; one you don't think will live more than two or three years.

Mr. Lee: I don't think it would hurt the roots to dynamite in the rows.

Mr. Powers: I mean, if you put it three or four feet away to one side, would it spoil the roots of the tree?

Mr. Lee: That would be pretty close; it might injure them. It depends upon the size of the trees. You might injure the ends of the roots of a large tree near it.

Mr. Powers: In a western paper it says with a tree that is not growing well to put sticks of dynamite three or four feet away and loosen the earth.

Mr. Lee: It would depend on the soil. If you had a soil with a good deal of rock in it and with a hard-pan down a couple of feet it might be a good thing.

Mr. Crosby: I wish to transplant some trees which I have to a new place. When shall I do it, in the fall of the year or when the ground is frozen?

Mr. Lee: Why not transplant them in the spring?

Mr. Crosby: Some of the trees are four or five inches in diameter. I am quite anxious to save them.

Mr. Lee: I have had no experience in that line. I think it could be done in the fall. If a trench was dug around them and the trench covered with mulch you could lift them in the spring.

Mr. Crosby: How about when the roots are frozen in the winter time, wouldn't that be best?

Mr. Lee: I would move them early in the spring while still frozen.

Mr. Kellogg: Is there danger of forming a cistern in heavy clay soil under a tree that would be a damage to it, to hold water?

Mr. Lee: How would you form such a cistern?

Mr. Kellogg: The dynamited hole.

Mr. Lee: I don't exactly get your idea. There can be no cistern as long as there is no air, and it certainly don't leave any air space if you fill the hole up afterwards. The hole isn't as big as you think. The hole isn't over three feet in diameter and the earth is loosened up around that hole for several feet further on.

Mr. Brackett: I would like to ask if you would recommend the planting of Delicious in a commercial way here in this part of Minnesota?

Mr. Lee: That is a very difficult question to answer. I have been experimenting along that line myself. I have a hundred, part of them on grafts and part of them on their own roots.

Mr. Brackett: Do you consider them hardy enough?

Mr. Lee: I think the roots are hardy enough, although the buds are very tender. They have light growth, and I think it is due to bud injury in the winter.

Mr. Richardson (of Winnebago): I wish to say that some fifteen years ago I top-worked a Delicious and the tree is there all right, but it never has borne a single apple. What is the cause of it I don't know, but there has never been an apple on that tree that I know of. I have done considerable top-working in my life, and I have found that some varieties do well on one kind and some on another. I top-worked some scions of a seedling I had there on a Hibernal and some on a Virginia crab. Those top-worked on the Hibernal never bore, never amounted to anything, while about four or five rods away those top-worked on a Virginia crab bore very heavily. It is a question of adaptability of the trees perhaps. I don't know the reason. I found another thing in top-working and in grafting; you don't always get exactly everything like you put in. I will bring up this afternoon some specimens of the Allen's Choice apples and you can taste them. The Allen's Choice is a sweet apple. I did the top-working, and I did the root grafting, and it was grown on a red crab tree, and I want some of you to taste the apples to see whether they are sweet apples.

Mr. Sauter: Mr. Lee, isn't there danger in dynamiting in an old orchard that the falling dirt will ruin the near-by trees by big chunks of dirt falling down upon the tops of the trees and spoiling them?

Mr. Lee: My experience is that the dirt doesn't come down in chunks; it rains down in very small particles.

Mr. Sauter: How do you put in your charge, do you cover it up?

Mr. Lee: Oh, yes. I pack the hole, that is, the hole made with the crowbar; otherwise it would shoot like out of a gun.

Mr. Sauter: I have a tree in my orchard, and I dynamited, and the big chunks of dirt came down and fell on some of the trees and ruined them.

Mr. Lee: How much dynamite did you use for a charge?

Mr. Sauter: Half a stick.

Mr. Lee: Half a stick of forty per cent.?

Mr. Sauter: Yes.

Mr. Lee: How deep did you put it?

Mr. Sauter: About a foot and a half.

Mr. Lee: Have you got clay top soil?

Mr. Sauter: Black loam soil.

Mr. Lee: Of course, when I dynamited in my orchard there were no trees in it. I didn't have any trouble with big chunks coming down, it was pretty well powdered up.

THE FUTURE OF COLD STORAGE.—In the June issue of COLD, under the above title, some of the present possibilities and improvements which have not yet been generally adopted, were discussed. To give some further idea of the scope of cold storage and some of its recent operations, let us consider a few of the things to which it has recently been applied; among them may be mentioned the following:

Curing tobacco, tempering watch springs, in the manufacture of rubber, drugs, syrup, soap, ink, paint, vinegar, isinglass, etc., in oil refineries, sugar refineries, chemical works, mercerizing works, photo material factories, in the manufacture of explosives, plows and other agricultural implements, optical instruments, electrical machinery, etc., in welding processes, for retarding growth of plants and vegetables, in laboratory work, hospital practice, shaft sinking and tunneling, for testing automobile parts, batteries, insulating material, paving material, etc.

The United States Department of Agriculture has done some very important work in the educating of the general public to the advantages of cold storage and also in making practical tests in the storage of various products. One of their most recent efforts along this line has been to show that eggs should be kept under refrigeration from the time they are gathered until disposed of. This would mean that every farm producing eggs for market, should have a satisfactory refrigerator, and at present not one farm in ten has such. The Department of Agriculture points out that the loss of eggs from heat damage during the summer amounts to at least 25 per cent of the total. It does not require but little imagination to see that this 25 per cent in value of the egg crop would in a short time pay for suitable refrigerating facilities for protecting the eggs on their journey from the producer to the consumer.

One of the most recent developments is the storage of apple cider under refrigeration. It has been demonstrated that fresh cider well clarified may be cold stored for several months without chemical treatment and without important change. This means that it may be kept "sweet" for this length of time so as to be palatable and useful as a beverage. This in itself opens up vast possibilities as an outlet for surplus and low grade apples.

Award of Premiums, Annual Meeting, 1916, Minnesota State Horticultural Society.

APPLES.

COLLECTION.

D. C. Webster, La Crescent, Webster, score 85, $2.85.
Sil Matzke, South St. Paul, score, 90, $3.05.
Geo. W. Strand, Taylors Falls, score 55. $1.90.
F. I. Harris. La Crescent, score 70, $2.35.
Dewain Cook, Jeffers, score 65, $2.00.
Fred Zuercher, Excelsior, score 68, $2.30.
P. H. Perry, Excelsior, score 50, $1.70.
W. S. Widmoyer, La Crescent, score 30, $1.05.
Henry Husser, Minneiska, score 83, $2.80.

LE ROY CADY, Judge.

SINGLE VARIETIES.

Lords L, Thos. Redpath, Wayzata, second premium, 50 cents.
Yahnke, Thos. Redpath, Wayzata, second, 50 cents.
Hibernal, D. C. Webster, La Crescent, second, 50 cents.
N. W. Greening, D. C. Webster, La Crescent, second, 50 cents.
Wealthy, D. C. Webster, La Crescent, second, 50 cents.
Longfield, D. C. Webster, La Crescent, first, 75 cents.
Gideon, D. C. Webster, La Crescent, third, 25 cents.
Superb, D. C. Webster, La Crescent, first, 75 cents.
Walbridge, D. C. Webster, La Crescent, first, 75 cents.
Yellow Transparent, M. Oleson, Montevideo, first, 75 cents.
Duchess, M. Oleson, Montevideo, second, 50 cents.
Duchess, Sil Matzke, South St. Paul, first, 75 cents.
Hibernal, Sil Matzke, South St. Paul, third, 25 cents.
Malinda, Sil Matzke, South St. Paul, second, 50 cents.
McMahon, Sil Matzke, South St. Paul, third, 25 cents.
Okabena, Sil Matzke, South St. Paul, first, 75 cents.
Patten's Greening, Sil Matzke, South St. Paul, 75 cents.
Peerless, Sil Matzke, South St. Paul, second, 50 cents.
University, Sil Matzke, South St. Paul, first, 75 cents.
Antonovka, Geo. W. Strand, Taylors Falls, third, 25 cents.
Borovinka, Geo. W. Strand, Taylors Falls, second, 50 cents.
Charlamoff, Geo. W. Strand, Taylors Falls, first, 75 cents.
Peerless, Geo. W. Strand, Taylors Falls, third, 25 cents.
Iowa Beauty, Geo. W. Strand, Taylors Falls, first, 75 cents.
Yellow Sweet, Geo. W. Strand, Taylors Falls, first, 75 cents.
Anis, D. T. Wheaton, Morris, first, 75 cents.
Malinda, Henry Husser, Minneiska, third, 25 cents.
Longfield, Henry Husser, Minneiska, second, 50 cents.
Jewell's Winter, Henry Husser, Minneiska, first, 75 cents.
Fameuse, Henry Husser, Minneiska, first, 75 cents.
Gideon, Henry Husser, Minneiska, second, 50 cents.
Lords L, Henry Husser, Minneiska, first, 75 cents.
Yahnke, Henry Husser, Minneiska, third, 25 cents.
Salome, Henry Husser, Minneiska, first, 75 cents.
Wolf River, F. I. Harris, La Crescent, second, 50 cents.
Peerless, F. I. Harris, La Crescent, first, 75 cents.
Fameuse, F. I. Harris, La Crescent, second, 50 cents.
Utter, F. I. Harris, La Crescent, first, 75 cents.
Antonovka, F. I. Harris, La Crescent, first, 75 cents.
Yahnke, F. I. Harris, La Crescent, first, 75 cents.
McMahon, F. I. Harris, La Crescent, second, 50 cents.
Okabena, P. H. Peterson, Atwater, third, 25 cents.
Jewell's Winter, P. H. Peterson, Atwater, second, 50 cents.
Scott's Winter, P. H. Peterson, Atwater, second, 50 cents.
Anisim, P. H. Peterson, Atwater, third, 25 cents.
Malinda, Dewain Cook, Jeffers, first, 75 cents.
Wolf River, Dewain Cook, Jeffers, first, 75 cents.
Wealthy, J. K. McBroom, Excelsior, first, 75 cents.
Patten's Greening, J. K. McBroom, Excelsior, third, 25 cents.
Patten's Greening, Frank Hatcher, Wayzata, second, 50 cents.
Okabena, Fred Zuercher, Excelsior, second, 50 cents.
McMahon, Fred Zuercher, Excelsior, first, 75 cents.
Anisim, Fred Zuercher, Excelsior, first, 75 cents.
Duchess, P. H. Perry, Excelsior, third, 25 cents.
Borovinca, P. H. Perry, Excelsior, first, 75 cents.
Ben Davis, P. H. Perry, Excelsior, third, 25 cents.
Yellow Transparent, P. H. Perry, Excelsior, second, 50 cents.
Tetofsky, P. H. Perry, Excelsior, first, 75 cents.
Charlamoff, P. H. Perry, Excelsior, second, 50 cents.
Wealthy, W. P. Burow, La Crescent, third, 25 cents.

SEEDLING VARIETIES—Continued.

N. W. Greening, W. P. Burrow, La Crescent, third, 25 cents.
Wolf River, Thos. Redpath, Wayzata, third, 25 cents.
Fameuse, W. S. Widmoyer, La Crescent, third, 25 cents.
Longfield, W. S. Widmoyer, La Crescent, third, 25 cents.
N. W. Greening, W. S. Widmoyer, La Crescent, first, 75 cents.
Plumb's Cider, W. S. Widmoyer, La Crescent, first, 75 cents.
Brett, F. I. Harris, La Crescent, first, 75 cents.
Hibernal, F. I. Harris, La Crescent, first, 75 cents.
University, F. I. Harris, La Crescent, second, 50 cents.
Gideon, Frank Hatcher, Wayzata, first, 75 cents.
University, Fred Zuercher, Excelsior, third, 25 cents.
Jewell's Winter, Fred Zuercher, Excelsior, third, 25 cents.
Anisim, P. H. Perry, Excelsior, second, 50 cents.
Antonovka, P. H. Perry, Excelsior, second, 50 cents.
Windsor Chief, W. S. Widmoyer, La Crescent, first, 75 cents.

R. S. MACKINTOSH, Judge.

COLLECTIONS, TOP-WORKED APPLES.

Thos. Redpath, Wayzata, score 43, $2.50.
D. C. Webster, La Crescent, score 48, $2.80.
Geo. W. Strand, Taylors Falls, score 52, $3.05.
P. H. Peterson, Atwater, score 69, $4.00.
Dewain Cook, Jeffers, score 100, $5.80.
Henry Vollenweider, La Crescent, score 35, $2.05.
Henry Husser, Minneiska, score 46, $2.68.
J. A. Howard, Hammond, score 36, $2.12.

F. I. HARRIS, Judge.

PECKS OF APPLES.

N. W. Greening, D. C. Webster, La Crescent, score 92, 70 cents.
Wealthy, D. C. Webster, La Crescent, score 90, 68 cents.
Walbridge, D. C. Webster, La Crescent, score 70, 52 cents.
Scott's Winter, D. C. Webster, La Crescent, score 80, 60 cents.
Jonathan, D. C. Webster, La Crescent, score 80, 60 cents.
Bethel, D. C. Webster, La Crescent, score 80, 60 cents.
Daisy, D. C. Webster, La Crescent, score 60, 45 cents.
Winesap, D. C. Webster, La Crescent, score 70, 52 cents.
Paragon, D. C. Webster, La Crescent, score 80, 60 cents.
Malinda, Sil Matzke, South St. Paul, score 75, 56 cents
McMahon, Sil Matzke, South St. Paul, score 75, 56 cents.
N. W. Greening, Sil Matzke, South St. Paul, score 80, 60 cents.
Patten's Greening, Sil Matzke, South St. Paul, score 70, 53 cents.
Wealthy, Sil Matzke, South St. Paul, score 80, 60 cents.
N. W. Greening, F. W. Powers, Minneapolis, score 50, 38 cents.
Wealthy, F. W. Powers, Minneapolis, score 60, 45 cents.
Wealthy, Miss Flora Moeser, St. Louis Park, score 60, 45 cents.
Salome, Henry Husser, Minneiska, score 80, 60 cents.
Wealthy, Henry Husser, Minneiska, score 75, 57 cents.
Jewell's Winter, Henry Husser, Minneiska, score 80, 60 cents.
Ben Davis, Henry Husser, Minneiska, score 82, 62 cents.
Peerless, F. I. Harris, La Crescent, score 50, 38 cents.
Wealthy, F. I. Harris, La Crescent, score 60, 45 cents.
Utter, F. I. Harris, La Crescent, score 70, 52 cents.
Wealthy, Joe Baumgardner, Robbinsdale, score 80, 60 cents.
Malinda, Dewain Cook, Jeffers, score 80, 60 cents.
Wealthy, J. K. McBroom, Exscelsior, score 88, 65 cents.
Patten's Greening, J. K. McBroom, Excelsior, score 80, 60 cents.
N. W. Greening, J. K. McBroom, Excelsior, score 80, 60 cents.
Lords L, Chas. Krause, St. Paul, score 70, 52 cents.
Wealthy, Fred Zuercher, Excelsior, score 80, 60 cents.
N. W. Greening, Fred Zuercher, Excelsior, score 80, 60 cents.
Wealthy, P. H. Perry, Excelsior, score 65, 49 cents.
Peter, P. H. Perry, Excelsior, score 70, 53 cents.
Wealthy, W. P. Burow, La Crescent, score 82, 62 cents.
N. W. Greening, W. P. Burow, La Crescent, score 82, 62 cents.
J. F. Bartlett, Excelsior, score 75, 57 points.
N. W. Greening, W. S. Widmoyer, La Crescent, score 85, 64 cents.
N. W. Greening, Henry Vollenweider, La Crescent, score 82, 62 cents.
Ben Davis, Henry Vollenweider, La Crescent, score 85, 63 cents.
Snow, Henry Vollenweider, La Crescent, score 80, 60 cents.
Blacktwig, Henry Vollenweider, La Crescent, score 83, 63 cents.
N. W. Greening, Jewell Nursery Co., Lake City, score 75, 57 cents.
Seedling, Dr. O. M. Huestis, Minneapolis, score 75, 57 cents.

GEO. W. STRAND, Judge.

BOXES OF APPLES.

D. C. Webster, La Crescent, score .956, $2.30; second premium, $10.
Wealthy, Sil Matzke, South St. Paul, score .796, $1.90.
N. W. Greening, Sil Matzke, South St. Paul, score .805, $1.95.
Patten's Greening, Sil Matzke, South St. Paul, score .720, $1.70.
Wealthy, F. W. Powers, Minneapolis, score .715, $1.70.
Apples, F. I. Harris, La Crescent, score .824, $2.
Keep-Till-June, Mrs. M. A. Knowles, Excelsior, score .695, $1.65.
Wealthy, J. K. McBroom, Excelsior, score .855, $2.10.
Wealthy, Fred Zuercher, Excelsior, score .866, $2.10; third, $5.
Wealthy, P. H. Perry, Excelsior, score .784, $1.85.
Wealthy, W. P. Burow, La Crescent, score .973, $2.35; first, $15.
Wealthy, J. F. Bartlett, Excelsior, score .751. $1.80.
Wealthy, Jewell Nursery Co., Lake City, score .660, $1.60.

W. G. BRIERLEY,
RICHARD WELLINGTON,
Judges.

BARRELS OF APPLES.

D. C. Webster, La Crescent, score .97, $2.95; first premium, $20.
N. W. Greening, Sil Matzke, South St. Paul, score .89, $2.75.
Wealthy, Sil Matzke, South St. Paul, score .905, $2.75; third, $10.
N. W. Greening, Henry Husser, Minneiska, score .895, $2.70; fourth, $5.
Apples, F. I. Harris, La Crescent, score .76, $2.30.
Wealthy, P. H. Perry, Excelsior, score .65, $1.95.
Wealthy, W. P. Burow, La Crescent, score .965, $2.90; second, $15.
J. F. Bartlett, Excelsior, score .64, $1.95.
Grimes Golden, Henry Vollenweider, La Crescent, score .805, $2.45.
N. W. Greening, Fred Zuercher, Excelsior, score .745, $2.30.

W. G. BRIERLEY,
RICHARD WELLINGTON,
Judges.

EARLY WINTER SEEDLING APPLES.

No. 26, W. S. Widmoyer, La Crescent, score 65, $4.65:
John Van Loon, La Crosse, Wis., score 60, $4.30.
No. 29, J. A. Howard, Hammond, score 85, $6.10.
W. H. Horton, Alexandria, score 50, $3.55.
M. Oleson, Montevideo, score 55, $3.95.
A. Brackett, Excelsior, score 75, $5.30.
Henry Husser, Minneiska, score 50, $3.55.
W. P. Burow, La Crescent, score 70, $5.
A. T. McKibben, Ramey, score 60, $4.30.
Mrs. A. Johnson, Minneapolis, score 75, $5.35.
M. Oleson, Montevideo, score 55, $3.95.

CLARENCE WEDGE,
CHAS. HARALSON,
GEO. W. STRAND,
Judges.

LATE WINTER SEEDLING APPLES.

Thos. Redpath, Wayzata, score 70, $2.25.
No. 32, M. Oleson, Montevideo, score 62, $1.95.
No. 11, M. Oleson, Montevideo, score 65, $2.10.
Timothy Ryan, Hopkins, score 80, $2.60.
Henry Husser, Minneiska, score 75, $2.40.
P. H. Peterson, Atwater, score 65, $2.10.
Louis Anderson, Gladstone, score 85, $2.70.
Dewain Cook, Jeffers, score 60, $1.90.
Wm. Schmidt, Excelsior, score 88, $2.80.
Henry Husser, Minneiska, score 65, $2.10.
Rolla Stubbs, Maple Plain, score 60, $1.90.
Mrs. M. A. Knowles, Excelsior, score 65, $2.10.
Dewain Cook, Jeffers, score 75, $2.40.
W. S. Widmoyer, La Crescent, score 75, $2.40.
J. S. Decker, Austin, score 45, $1.40.
H. L. Runck, New Ulm, score 60, $1.90.
H. L. Runck, New Ulm, score 67, $2.15.
No. 17, J. A. Howard, Hammond, score 90, $2.90.
No. 19, J. A. Howard, Hammond, score 95, $3.10.
No. 23, J. A. Howard, Hammond, score 73, $2.35.
No. 7, J. A. Howard, Hammond, score 55, $1.75.
Arnt Johnson, Viroqua, Wis., score 85, $2.75.

CLARENCE WEDGE,
CHAS. HARALSON,
GEO. W. STRAND, Judges

GRAPES.

Collection, Sil Matzke, South St. Paul, first premium, $8.

A. BRACKETT, Judge.

NUTS.

Hickory, D. C. Webster, La Crescent, first premium, $1.
Butternuts, Geo. W. Strand, Taylors Falls, fourth, 25 cents.
Butternuts, D. T. Wheaton, Morris, first, $1.
Hickory, Henry Husser, Minneiska, second, 75 cents.
Walnuts, Henry Husser, Minneiska, first, $1.
Butternuts, Henry Husser, Minneiska, second, 75 cents.
Hickory, F. I. Harris, La Crescent, third, 50 cents.
Walnuts, F. I. Harris, La Crescent, third, 50 cents.
Hazel nuts, Fred Zuercher, Excelsior, first, $1.
Black walnuts, Fred Zuercher, fourth, 25 cents.
Black walnuts, W. S. Widmoyer, second, 75 cents:.
Butternuts, W. S. Widmoyer, third, 50 cents.

THOMAS REDPATH, Judge.

PLANTS.

Collection, 12 palms, Swanson Floral Co., Minneapolis, first premium, $10.
Collection, 12 ferns, Swanson Floral Co., Minneapolis, first $10.
Collection, 12 blooming plants, Swanson Floral Co., Minneapolis, first, $12.
Collection, 12 ferns, Merriam Park Floral Co., Merriam Park, second, $7.
Collection, 12 blooming plants, Merriam Park Floral Co., Merriam Park, second, $9.

CUT FLOWERS—ROSES.

Red roses, Swanson Floral Co., Minneapolis, second, $2.
Pink roses, Swanson Floral Co., Minneapolis, first, $3.
White roses, Swanson Floral Co., Minneapolis, second, $2.
Yellow roses, Swanson Floral Co., Minneapolis, third, $1.
Red roses, A. N. Kinsman, Austin, first, $3.
Pink roses, A. N. Kinsman, Austin, second, $2.
Yellow roses, A. N. Kinsman, Austin, second, $2.
Red roses, N. Nielson, Mankato, third, $1.
Pink roses, N. Nielson, Mankato, third, $1.
White roses, N. Nielson, Mankato, first, $3.
Yellow roses, N. Nielson, Mankato, first, $3.

CUT FLOWERS—CHRYSANTHEMUMS.

12 Yellow chrysanthemums, J. A. Webber, Excelsior, first, $4.
12 Yellow chrysanthemums, John E. Sten, Red Wing, third, $2.
12 any color chrysanthemums, John E. Sten, Red Wing, first, $4.
12 Yellow chrysanthemums, Swanson Floral Co., Minneapolis, second, $3.
12 any color chrysanthemums, Swanson Floral Co., Minneapolis, third, $2.
12 pink chrysanthemums, A. Herzog, 3526 Penn Ave. No., Minneapolis, second, $3.

CUT FLOWERS—CARNATIONS.

25 red carnations, John E. Sten, Red Wing, first, $3.
25 pink carnations, John E. Sten, Red Wing, third, $1.
25 white carnations, John E. Sten, Red Wing, third, $1.
25 white carnations, John E. Sten, Red Wing.
25 red carnations, Hans Rosacker, 19th Ave. & Stinson Blvd. NE., Minneapolls, third, $1.
25 white carnations, Hans Rosacker, 19th Ave. & Stinson Blvd. NE., first, $3.
25 pink carnations, Hans Rosacker, Minneapolis, second, $2.
Red carnations, A. N. Kinsman, Austin, second, $2.
Pink carnations, A. N. Kinsman, Austin, first, $3.
White carnations, A. N. Kinsman, Austin, second, $2.

BASKETS.

Basket, Swanson Floral Co., Minneapolis, first, $10.

WM. DESMOND, Judge.

VEGETABLES.

Onions, red, J. F. Olinger, Hopkins, second, $2.
Onions, yellow, J. F. Olinger, Hopkins, first, $3.50.
Onions, yellow, S. O. Gates, Hopkins, second, $2.
Onions, red, S. O. Gates, Hopkins, fourth, 50 cents.
Onions, white pickling, Wm. E. Noack, R. 1, St. Paul, third, $1.
Beets, Daniel Gantzer, Merriam Park, third, $1.
Cabbage, Daniel Gantzer, Merriam Park, second, $2.
Carrots, Daniel Gantzer, Merriam Park, third, $1.
Celeriac, Daniel Gantzer, Merriam Park, first, $3.50.
Potatoes, Frank Dunning, Anoka, first, $3.50.
Pie pumpkins, Frank Dunning, Anoka, third, $1.
Hubbard squash, Frand Dunning, Anoka, first, $3.50.
Parsnips, J. F. Olinger, Hopkins, second, $2.
Salsify, J. F. Olinger, Hopkins, first, $3.50.
Hubbard squash, Isabella Atherton, Newport, second, $2.
Parsley, Daniel Gantzer, Merriam Park, first, $3.50.
Parsnips, Daniel Gantzer, Merriam Park, first, $3.50.
Potatoes, Daniel Gantzer, Merriam Park, second, $2.
Pie pumpkins., Daniel Gantzer, Merriam Park, second, $2.
Salsify, Daniel Gantzer, Merriam Park, second, $2.
Hubbard squash, Daniel Gantzer, fourth, 50 cents.
White turnips, Daniel Gantzer, second, $2.
Onions, white, Daniel Gantzer, St. Paul, third, $1.
Onions, yellow, Daniel Gantzer, St. Paul, fourth, 50 cents.
Onions, white pickling, Daniel Gantzer, St. Paul, fourth, 50 cents.
Carrots, Aug. Bucholz, Anoka, second, $2.
Beets, Mrs. E. H. Haeg, Minneapolis, second, $2.
Cabbage, Mrs. E. H. Haeg, Minneapolis, fourth, 50 cents.
Lettuce, Mrs. E. H. Haeg, Minneapolis, first, $3.50.
Onions, white, Fred Scherf, Osseo, second, $2.
Cabbage, Jos. Baumgardner, Robbinsdale, first, $3.50.
Onions, red, P. H. Peterson, Atwater, first, $3.50.
Beets, J. F. Held, St. Louis Park, fourth, 50 cents.
Carrots, J. F. Held, St. Louis Park, first, $3.50.
Celery, J. F. Held, St. Louis Park, second, $2.
Onions, white globe, Fred Wilson, Minneapolis, first, $3.50.
Celery, Fred Wilson, Minneapolis, first, $3.50.
Onions, pickling, H. G. Groat, Anoka, second, $2.
Beets, Chas. Krause, Merriam Park, first, $3.50.
Cabbage, Chas. Kraus, Merriam Park, third, $1.
Celeriac, Chas. Krause, Merriam Park, second, $2.
Onions, red, Chas. Krause, Merriam Park, third, $1.
Onions, white, Merriam Park, fourth, 50 cents.
Onions, yellow, Chas. Krause, Merriam Park, third, $1.
Onions, pickling, Chas. Krause, Merriam Park, first, $3.50.
Carrots, J. F. Olinger, Hopkins, fourth, 50 cents.
Rutabagas, Daniel Gantzer, St. Paul, fourth, 50 cents.
Rutabagas, Aug. Bucholz, Anoka, third, $1.
Radishes, Mrs. E. H. Haeg, Minneapolis, first, $3.50.
Hubbard squash, Mrs. E. H. Haeg, Minneapolis, third, $1.
Parsley, Mrs. E. H. Haeg, Minneapolis, fourth, 50 cents.
Rutabagas, Fred Scherf, Osseo, first, $3.50.
White turnips, J. F. Held, St. Louis Park, first, $3.50.
Rutabagas, J. F. Held, St. Louis Park, first, $3.50.
Rutabagas, J. F. Held, St. Louis Park, second, $2.
Potatoes, J. F. Held, St. Louis Park, fourth, 50 cents.
Pie pumpkin, J. F. Held, St. Louis Park, fourth, 50 cents.
Parsely, J. A. Webber, Excelsior, third, $1.
Parsnips, H. G. Groat, Anoka, fourth, 50 cents.
Parsley, Chas. Kraus, Merriam Park, second, $2.
Parsnips, Merriam Park, third, $1.
Pie pumpkins, Chas. Kraus, Merriam Park, first, $3.50.
Salsify, Chas. Kraus, Merriam Park, third, $1.
White turnips, Chas. Krause, Merriam Park, third, $1.
Potatoes, P. H. Perry, Excelsior, third, $1.

J. V. BAILEY, Judge

Collegeville Trial Station in 1916.

REV. JOHN B. KATZNER, SUPT.

We regret to say that our expectation of a good fruit crop did not verify. Everything looked so promising last spring: the winter was not too cold, the trees though late were full of flowers, and no late spring frosts interfered with setting a good crop of fruit. And yet our crop, as in many other places, was very small and inferior. We can only attribute this failure to the many rains and unseasonable cold weather during May and June, followed by the excessive heat of July and August. Most varieties of apples dropped their flowers entirely or set only a few fruits. To make things worse, blight set in when the trees started to grow vigorously in July, which in spite of all the cutting could not be kept in check. Many trees were simply ruined, and we were obliged to cut a large block of trees from the orchard. It is most discouraging to see a promising orchard gradually ruined by blight. Would it not be possible to breed blight proof apple trees just the same way as Prof. N. E. Hansen is doing with pears?

The best bearing varieties this year were the Hibernal, Duchess, Anisim and Patten's No. 108. All others bore very little fruit and quite inferior. Patten's Greening was small and partly full of cracks, just like ripe plums crack after a rain. The apples were about three weeks later in ripening and their quality was not up to its usual excellence. This might also have been brought about by the adverse condition of the weather. The new varieties of apple trees obtained last spring from the State Fruit-Breeding Farm are all alive and made a good growth. We expect to find some good kinds among them. Besides these we have a few seedings of our own raising which look very promising.

Mr. Chas. Patten's pear seedling is a wonderful grower. Grafts inserted on German stocks made a growth of more than five feet over summer. One being three years old may bear next year. As most of these trees were standing among the old plum trees, and the place is needed for the better arrangement of the orchard, they were taken out and heeled in over winter and will be planted in a small trial orchard next spring. We have six varieties of Prof. N. E. Hansen's new hybrid pears, grafted also on German pear stocks. They are now two years old, and most of them have made a splendid growth; some are seven feet high. We like especially No. 10 for its fine, stocky growth, large green,

beautiful leaf and few spines. They too have been heeled in over winter and will find their place in the trial orchard. In regard to blight they are so far immune, not a blighted leaf or branch was seen on the trees, although other pears standing around them blighted to the ground. They also seem to be perfectly hardy. Thus we have reasonable hope for successful pear-growing in Minnesota.

Scotch pine on south slope three years after planting—at Collegeville.

The old plum trees have done a little better than the apples. We got at least half a crop. Most of these old trees are now removed, and the plum orchard will get a new location. Of the new plums from the Fruit-Breeding Farm we cannot say very much yet. Most of the trees bloomed well but ripened only a few plums. The largest and best plum was again No. 8. The fruit was fully 1¾ inches long and almost that in diameter. Then there were Nos. 10, 20, 15, 11, 3 and 2. All of these were nice large plums, but not all of equal quality. No. 2 had the most plums, which were relished by many. We are waiting for a full crop, then we shall be able to pass better judgment on these new plums. We have lost a few trees, one each of Nos. 16, 20, 8, 3 and 21, and two or three trees have been injured by storms.

Of all fruits the grapes have done the best. There were no frosts during May and June like last year, and the vines though kept back by cool weather finally came out strong for a full crop. The only disadvantage for doing their best was the short season for ripening their fruit well. Being about three weeks later than normal years, only the earliest varieties came to maturity. Late sorts such as the Concord never got ripe. The Concord too was

Scotch pine forest fifteen years old—at Collegeville.

affected by mildew and produced very little fruit. All others did well; we gathered some five bushels of tame grapes. But the best bearing vine which ripened its fruit was the Alpha. It was just loaded with fine clusters of grapes. In the line of fruits we never saw a more beautiful sight than this vine. On one nine year old vine we counted eighty bunches. They were a surprise and an admiration to all visitors who had a chance to see them. We gathered ten bushels of grapes from the Alpha vines. The Alpha vines should be pruned every fall, otherwise bunches and berries would stay considerably smaller. That the Alpha is a hardy vine is shown by the fact that it was bearing this year at Thief River Falls, about 350 miles northwest of St. Paul.

As stated in a former report we planted a new bed of everbearing strawberries, No. 1017, in spring, to which were added the plants, also No. 1017, received from the Fruit-Breeding Farm. They were well taken care of but did not do nearly as well as the preceding year. They produced some berries but on the whole were not satisfactory. At the same time and from the same source some strawberry plants of No. 3 were set out. These

Scotch pine forest twenty years old—at Collegeville Station.

plants made a splendid growth and promise well for a good crop next year.

Currant bushes have done fairly well and quite a quantity of berries have been picked from them.

Not much was done in forestry, only a few hundred Scotch pines were set out.

Our little nursery is in good condition, and the grafts of apples, pears and plums made a good growth. A few pear buds of No. 26485 from the U. S. Dept. of Agr. inserted on German pear stocks grew very well all summer, but in September they blighted to death. Apple trees have been removed from the nursery and made ready for next year's planting.

The vegetable garden again furnished us all kinds of vegetables and plenty of them during the season. It paid well for the work and care. As we had many rains during the summer months irrigation was not much needed for the best growth of plants. The root-cellar is now well filled with vegetables for use during winter.

If there was anything worth while seeing at our place during the season, it was our floral planting. The artistic floral and foliage designs on our lawns were most beautiful. There were flowers of many kinds in profusion at all times. We admired in particular the peonies, dahlias, cannas, lilies and gladioli; of shrubs, the lilacs, spireas and mock orange.

This year has brought us meager returns not only in horticulture, but in agriculture as well, for the labor and care bestowed on our orchards and fields. Another year may bless us with an abundance of fruit.

WARNING. WHITE PINE TREES BEING DESTROYED.—A disease known as the White Pine Blister Rust threatens the destruction of all the white pine and other five leaved pine trees in the United States.

It has already appeared in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Wisconsin, Minnesota and in Quebec and Ontario.

There is no known cure for it. It kills the white pines infected and it spreads steadily. The spores or seeds are blown from diseased pines to currant and gooseberry bushes. They germinate on the leaves of these bushes. The leaves then produce millions of spores or seeds of the disease which are blown by the wind from the bushes to the pines, and even those several miles distant from the nearest bushes are infected, become diseased and die.

The white pines in New England are worth $75,000,000; in the Lake States $96,000,000; in western States $60,000,000; and in the National Forests $30,000,000,000, or a total of $261,000,000.

Unless the ravages of the White Pine Blister Rust are stopped these pines will be destroyed.

The American Forestry Association urges people in all the regions where the disease has been discovered to destroy at once all currant and gooseberry bushes, diseased pines, and others exposed to infection. This will help to stop the spread of the disease.—American Forestry Association, Washington, D. C.

Apples and Orchards.

E. A. SMITH, VICE-PRESIDENT, JEWELL NURSERY CO., LAKE CITY.

The problem of marketing apples is as great as the problem of planting and caring for the orchard itself. Any information derived from practical experience should prove interesting and profitable to apple growers in the northwest.

Size of Orchard and Varieties.—The writer believes that a mistake is often made in planting too many varieties in a commercial orchard. There should not be more than five varieties, each consisting of a sufficient number of trees so there will be a carload or more to market at a given time. The reason for this is, that apples can be handled in car lots more economically and the profit will be correspondingly greater. If shipped to commission men, they prefer them in car lots and can dispose of them at better prices in quantity, and will usually buy them at a given price on the tree or delivered F. O. B. shipping station in car lots.

Among the varieties to plant, in locations similar to that at Lake City, the writer would select about 100 trees of the Duchess type, 100 of the Okabena, 600 of the Wealthy, 100 of the Northwest Greening and 100 of some late winter apple. I use the word "type" in a broad sense, for it may be a matter of opinion rather than of merit as to which varieties are really the best and most profitable. The writer would not attempt to dictate in this regard, as the location must influence the selection. For instance, at Lake City and vicinity and along the bluffs of the Mississippi, the Northwest Greening is one of the most desirable varieties to plant, as it yields well in that locality and hangs on the tree well. The tree is vigorous and comparatively long lived, and there is never any trouble selling the apples at a good price. In some parts of the state, this variety is not a success. Therefore, the locality will have to be taken into consideration in determining what to plant. I do not, however, recommend the Northwest Greening for general planting.

The advantage of planting the Duchess type, is, that the process of picking may be commenced early. By getting these varieties on the market early and in good shape, a good price can generally be realized. Then follows the Okabena. This variety of apple is always in demand and the market never glutted. The apple is attractive, is a splendid all around variety for the season, a heavy bearer and the tree is vigorous. These early varieties

should not be allowed to ripen on the tree, but should be picked a little on the green side as they will ship much better and reach the market in better condition. Then comes the Wealthy. The weakness of this apple commercially is that it falls from the tree with the slightest provocation and many apples are lost, or on account of being bruised they must be graded low, bringing a correspondingly low price. The Northwest Greenings may be picked last. They hang on the tree well, pack splendidly and are

E. A. Smith, Lake City.

as attractive as any green colored apples that are put on the market.

The writer has found there is a demand for crab apples at a good price, and a hundred crab apple trees would be found profitable, as the fruit seldom sells for less than $1.50 per bushel and usually brings more.

Apples for Live Stock.—We find in a recent article in one of the horticultural magazines, a correspondent advises that apples are the best conditioner for horses, cattle, sheep and swine that can be grown on the farm. The correspondent referred to stated that he was able to raise healthy hogs in the midst of a hog cholera epidemic with which surrounding herds were completely annihilated. This correspondent writes that he fed his

hogs liberally with apples from the middle of July to the end of the season, that the hogs were directly exposed to infection from other herds, but he did not lose one. This fact alone, fully established, means thousands of dollars to the farmers of the northwest and is a big asset for the apple.

Commission Men.--We have heard a great deal about commission men disposing of apples at such low prices there was no profit to the seller. In many instances the writer believes that these low prices were made necessary because the apples were poorly packed or were of poor quality. We have found reliable commission men prompt in their returns, anxious to please the customer and reliable in their reports. Their commission varies from ten to fifteen per cent. upon sales, depending upon conditions connected with the sale.

Packing the Apples.—The ordinary farmer pack is the poorest of all. If the apples are faced, the work is often poorly done, the apples being thrown hit or miss in the barrel, thus reducing the best ones to the lowest grade price. In packing apples, the barrel pack is the most economical and the best for this section of the country. All grades of apples should be faced with two tiers and legitimately these may consist of the best apples in

Partial view of Jewell Nursery Co.'s Bluff orchard, at Lake City.

the grade. The first and second grades should not contain apples smaller than 2½ inches in diameter. The third grade may contain apples two inches in diameter.

Cost of Raising Apples.—In a recent magazine, I found the average expense per acre for an orchard in New York, including interest, taxes and every item of expense was $70.50 per acre and the net profit was $196.26 per acre.

In the State of Washington, the average cost per bushel is 24c to grow, 16c to harvest, 10c for the box, making the cost,

Spraying in the Jewell Bluff orchard.

F. O. B. orchard, 50c per box, to which must be added interest and taxes on land valued at $200.00 per acre before planting and $500.00 to $600.00 per acre after the orchard comes into bearing. Only the choice fruit is shipped, and this is usually sold at from 90c to $1.00 per bushel, F. O. B. shipping station.

In Minnesota, choice Wealthy apples can be grown at a total cost of 50c per bushel and sold at an average of $1.00 per bushel on land worth not to exceed $50.00 per acre before planting.

Selling Price of Apples.—The third week in September this year apples were beginning to arrive from Maryland and that section of the country, and prices were quoted on such varieties as York Imperial, Jonathan, etc., at $2.40 per barrel, at shipping station. The freight would be 65c, which would make the net cost, laid down at St. Paul or Minneapolis, about $3.00 per barrel for southern apples. Also apples from Missouri and Kansas

were quoted at $2.50 per barrel at shipping station, plus the freight of about 40c per barrel, making them net at Minneapolis $2.90, car load lots. At the same time the best quality of Wealthy apples were selling to the trade at $4.00 per barrel, F. O. B. shipping station, within a radius of 75 miles of the Twin Cities, and were selling at retail to customers in such varieties as Jonathan and Wealthy at 20c per dozen, 5c per pound and up, depending upon quality, making a retail price of $2.00 or more per bushel. Apples 2½ inches and up average about 140 to the bushel.

Best Location for An Orchard.—There are thousands of acres of land located on the bluffs and along the banks of the Mississippi and throughout the northwest, which are admirably adapted to growing apples upon a commercial scale. The bluffs which slope to the north and east are the best. At present most of them are covered with underbrush or a poor class of timber. Such land may be called practically valueless, so far as the present income derived from it is concerned. The timber, however, will usually pay for clearing the land.

The Jewell Bluff Orchard.—The Jewell Nursery Company, of Lake City, Minn., endeavored to solve the problem of making such land profitable by clearing one of these steep bluffs. The cost of clearing the timber and digging roads on the side hill so that teams could traverse them, was estimated at $50.00 per acre. The orchard was planted largely to Wealthy, Northwest Greening and Virginia crab apples. The latter were planted for the purpose of top-working, which has since been done, being top-worked very largely to the Wealthy. Except for semi-hardy varieties, I can not say that I especially recommend top-working apple trees. The orchard now consists of about twenty-one acres and 1,900 trees. As the process of clearing and planting has extended over several years, not more than a thousand of these trees have come into bearing, and a number of these have only borne one or two years. It was this orchard that won two first prizes for the State of Minnesota at the Spokane National Apple Show in 1909 and 1911, in competition with twelve north central states, demonstrating the fact that Minnesota could grow as fine apples as can be grown anywhere.

As the trees are located on a steep side hill, it is not possible, and not necessary, to cultivate the entire orchard, and so the sod is removed from around the trees for a space of about six feet in diameter and the earth is stirred two or three times during

the summer so it will not bake and also to conserve the moisture. Sheep are pastured in this orchard.

Spraying.—Our first spraying, spring of 1916, was done early, before the trees started to bloom. The second spraying was done just after the trees had blossomed and before they had completely set their fruit. The third spraying was done in the early summer. The spray used for each of the three treatments

Jewell's Winter apple tree, in Jewell Bluff orchard.

consisted of lime-sulphur, arsenate of lead and nicotine, the first spray being in proportion, 63 gallons of lime-sulphur to 378 gallons of water. The second spray, 13½ gallons of lime-sulphur, plus 54 lbs. of arsenate of lead, plus 4½ pints of nicotine to 450 gallons of water. The third spray consisted of 18 gallons of lime-sulphur, 72 lbs. of arsenate of lead, 6 pints of nicotine to 600 gallons of water.

We use a two-horse sprayer which requires one man to drive and two men to spray. The orchard is thus quickly covered. The total cost of the spray material was $27.00.

Yield, Receipts, Expense and Profit.—We figured that we had about a 50 per cent. crop upon trees that were in bearing. Our orchard is divided into three sections. The first or early planting consists of about 500 trees, which average eight inches

in diameter. The second section consists of 100 trees, which average five to six inches in diameter. The third section, and the last planted, consists of about 400 trees, which run two inches in diameter. Our total yield was 1,407 bushels. The total receipts were $1,233.86. The total expenses were $746.28, leaving a credit balance and profit, not including interest and taxes, of $487.58. As four acres of this orchard are not yet in bearing, and four acres have just commenced bearing, the thirteen acres which are in bearing took care of and paid for the work upon the entire orchard. We believe that this expense more than equaled the interest and taxes for the year. Two hundred and forty-eight bushels of apples practically worthless for marketing were sent to the pigs. This was a very large proportion of poor fruit, the percentage of which we shall try to reduce the coming year. The real value of these apples for conditioning purposes is not known.

SUMMARY.

1. If thinning is necessary, pick those apples which are scabby or misshapen, as they will probably go on the dump pile anyway. If you are intending to sell the apples green, the best must be picked.
2. Estimate the amount of the crop the latter part of July. Then order barrels sufficient to cover the estimate.
3. Arrange with commission men, or others, for the sale of the apples before they are picked. Reliable commission men will do their best for you in marketing your fruit, but you must get it to them in good condition.
4. To avoid bruising, use sacks for picking in, or baskets that are lined.
5. Arrange for spraying. Have the material ready in time and have the work well done at the proper time.
6. Have the tables lined, sides and bottom, where the apples are sorted.
7. Use a screw press for heading barrels.
8. Face the top of the barrel with two tiers of the best apples in the grade. Do not use old or dirty barrels for shipping.
9. A spring wagon should be used for hauling the apples.
10. In Minnesota, the barrel is the best and most economical form of pack.
11. Apples are the best conditioner for live stock that can be found.
12. An apple eaten each day will do much toward keeping the doctor away.
13. Utilize the waste land profitably by planting an orchard upon it.

14. If the fruit grower can establish his brand and secure a list of customers from year to year, selling them apples that will satisfy, he can get the retail price and increase his profit.

15. The profitable result of growing apples is in securing a market, adopting intelligent methods in selling and in keeping down the overhead expense.

Mr. Kellogg: I wish to ask the result of the painting for blight; was there any good from it?

Mr. Smith: We have tried it. I would refer that question to Mr. Underwood, who is present.

Mr. Underwood: I suppose Mr. Kellogg refers to our painting our orchard trees with a preparation, I think it was called Warnocks. Some man down in Missouri, I can't remember so very much about it, anyway he recommended a paint that would prevent blight. I painted our trees with that preparation, and all I can say is we haven't had any blight, but it takes more than one swallow to make a spring, and I am not ready to recommend it. I have heard that the preparation has been condemned and there has been some trouble about it, but I don't know the particulars about it. I know that our trees have not blighted since we put that preparation on. But we do not have much blight, it was only some Wealthy trees that had commenced to blight a little, and so we painted the trees. I shall try it some more. I have a little confidence in it, but I haven't had the experience that would warrant me to say to this society, by all means get that Warnock paint and paint your trees if you have any trouble with blight.

Mr. Powers: How do you paint them, put it on with a spray?

Mr. Underwood: No, you scrape the roughness of the bark off from the body of the tree clear down to the ground and take the dirt away at the root of the tree and then apply it with a brush. It smells something like a petroleum product, I think it has that appearance. I don't know whether any one else knows anything about the paint or not.

Mr. Ludlow: Will that paint keep off mice and rabbits?

Mr. Underwood: I don't know that. I want to say right here that the way to keep the rabbits and mice from girdling your trees is to get rid of the rabbits and mice. Don't have any rabbits and mice, then you won't have any girdling, and it is easily done.

The President: Tell us how you do it.

Mr. Underwood: Our president gave us a splendid remedy at one of our meetings. He said to put some corn shocks around your orchard, have something for them to eat there and then put some poison in, I think. Anyway, that is what I would do. That will keep the rabbits away. But we have a man that works for us in the nursery a great deal, an old gentleman, and in the winter time he doesn't work and he hasn't anything else to do. He

goes around in our orchards and the way that man catches rabbits is really a wonder. He snares them, and we pay him 10 cents a piece for the ears, and then he has the rabbit left. I don't know whether he does anything with the skins or not but he certainly has a good many rabbits to eat. If you believe in eating meat at all a rabbit is good eating. The way we do to get rid of mice is to put a can at every tree in the orchard with a little poisoned grain in it. Lay the can down on its side, and the mice will get it. If you haven't any mice in your orchard there is no danger.

Mr. Anderson: How do you poison the grain?

Mr. Underwood: Soak it in strychnine.

Mr. Harrison: One of the best remedies to get rid of mice and rabbits from the trees is to get some of the cheapest soap you can find and rub it up and down on the tree. The rabbit is a kind of a dainty fellow, and he don't like soap.

Prof. Hansen: I would like to ask Mr. Smith if he would recommend any apple earlier than the Duchess for commercial planting?

Mr. Smith: The Yellow Transparent and the Tetofsky are very generally used in this section of the country. They are early apples, but they are poor shippers. Whether to plant them in a commercial orchard is a question. I can't say I would. There are other fruits which take the place of the early apple. You have the early crab and have small fruits, and by the time they, and some of Hansen's new fruits, are through you are ready for the apple.

Mr. Horton: You spoke about planting trees of a late winter variety. What would you recommend?

Mr. Smith: If I should recommend any I might recommend several, but I think that is for the party to decide in the locality where he lives.

Mr. Underwood: Malinda.

Mr. Smith: No Malinda for me. So there is a difference of opinion.

Mr. Underwood: I don't know why we should not grow the Malinda. It is better apple than the Ben Davis, a perfect keeper, and it is a prolific bearer. I want to tell you that eleven miles from Philadelphia is a large commercial orchard, several hundred acres and a great many thousand trees, and what apple do you suppose they grow the most of? It is the Ben Davis, and I would rather have the Malinda any time than the Ben Davis. The Malinda is a good apple. One of our members who isn't here now says that he depends upon his children to tell whether apples are good to eat. They go down and get all the Malinda apples they can get, and he says if it is good enough for the children it is good enough for him.

Mr. Vollenweider: In regard to the Malinda and Ben Davis. The Ben Davis is a red apple and the Malinda a yellow apple, and the people all take to a red apple in preference.

Mr. Smith: In connection with the Malinda apple, I speak of it from a commercial standpoint. I find it is not a favorite in the market and doesn't bring a high price. It comes in competition with the late keeping varieties, and it does not compare favorably with those in looks and in price.

A Member: I would like to have that subject of a late apple discussed here since we have time. In our part of the country along the river shore we can raise better kinds than the Malinda. The Malinda with me runs rather smaller than the market favors. We tried some Salomes, and they did exceedingly well. It is a nice tasting apple and it has a nicer color. The tree looks hardy enough along the river. It is a late apple. I would give preference to the Salome. About the other late varieties of apples which were mentioned this morning, like the Stark Brothers Delicious, it is a question whether it will ever be a success. It seems they don't develop a big enough apple for the commercial orchard.

Prof. Hansen: I would say I was very much interested in Mr. Smith's statement, and I thought maybe I was working along the wrong line; that is, for extra early apples. Some years ago I spent a day in Winnipeg, Canada. There were some of the Yellow Transparent apples, very large, wrapped in paper in a small crate. They sold well, and ever since then I have thought there was a market for a very early apple. I worked a little in that line to get an extra early apple ahead of the Duchess. If there isn't any market for such an apple I worked along the wrong line. I know the Yellow Transparent blights badly in places and also that the Tetofsky is more of a home apple, not a shipper. It seems to me there is a chance for an early apple. The Yellow Transparent would fill the bill if it didn't seem to blight in so many places.

Mr. Smith: In partial answer to Professor Hansen's question regarding the early apple: There isn't a great demand for it in the market, for the reason that it is apt to decay and perish very quickly. There is a competitor in the shape of the Duchess picked nearly ripe. That makes splendid sauce, and that is about the principal use we make of the apple at that time. So I don't believe that commercially the early apple would be very desirable. I think in this country we want a late apple, not an early one.

Mr. Underwood: May I add a word in regard to the early apple. Mr. George T. Powell, who, you remember, was with us a few years ago, told us that the apple that he made the most money from was the Wealthy, and he picked it early. He recommends picking them early, that they are an early apple. Last winter I talked with Mr. John Collins, who has the large commercial orchard I spoke of eleven miles from Philadelphia, and he says that the apple that he makes the most money off of is his Wealthy, because he commences picking them early. Now, the idea is, your Wealthy and your Duchess bear too full, the

trees are loaded too much, and they fall off. Pick the largest apples, pick them early and put them on the market, and you will get a good price for them. That thins the tree out so that the apples that are left have a better chance to develop. That is one way to get early apples; pick the largest apples off the trees as soon as they are ready to pick, and they are bought readily for green apples. Green apple pies, you know they are good, and green apple sauce you know is good; and they bring a good price.

Mr. Vollenweider: I have Duchess in my orchards, and I favor the Duchess. I do like Mr. Underwood says. I go to work and thin my Duchess and barrel them up and ship them to Minneapolis. They sell there for $3.75 a barrel. That gives me a better chance on the others, and they come along, and I get a good price for them. Last year when the Chicago markets were flooded with apples they told me I would lose money to ship my apples down there, but I did so and they brought me $3.75 a barrel when I couldn't have sold them at home for twenty-five cents a bushel. I thought I would set out some more Duchess because I like them as well as any other kind.

Mr. Hall: I would like to ask Mr. Smith to tell us how to raise the best apples for exhibit purposes.

Mr. Smith: In 1909 and 1911 here is what we did. When we picked our apples, we picked three barrels of the very finest apples that were in the orchard. These were wrapped in paper at that time, and about three weeks later the apples were again picked over and the best picked out of those, from which we succeeded in getting one barrel. These were shipped by express to Spokane, and those were the apples which took prizes in 1909 and 1911. This year we picked a box of the finest Wealthys we had and sent them to cold storage. I unpacked them yesterday. They had evidently been weighed down with about a ton of something else, and every apple was jammed. The apples were all right, but the method of handling has probably prevented them from being prize winners. So, as careful as you may be, someone else may spoil all your care.

Mr. Hawley: I wanted to know as to the method of procedure of thinning, when you do it and how much thinning you do, whether it would be advisable or not.

Mr. Smith: We commenced to thin our apples the latter part of August. We sent some to market too soon. They ought never to be thinned until they begin to be colored a little, else you will get a very low price. As soon as they begin to color a little, if you wish to market them that way, pick the biggest and the best.

Fruits for Minnesota Planting.

List adopted by the Minnesota State Horticultural Society, Dec. 8, 1916. *For the guidance of planters.*

APPLES.

Of the first degree of hardiness: Duchess, Hibernal, Patten's Greening, Okabena.

Of the second degree of hardiness: Wealthy, Malinda, Anisim, Iowa Beauty, Lowland Raspberry, Jewell's Winter, Milwaukee.

Valuable in some locations: Wolf River, Yellow Transparent, Longfield, Northwestern Greening, Tetofsky, Peerless, Salome.

Most profitable varieties for commercial planting in Minnesota: Wealthy, Duchess, Okabena, Anisim.

Recommended for top-working on hardy stocks: Wealthy, Malinda, N. W. Greening, Stayman's Winesap, Grimes Golden, Milwaukee, McIntosh, Salome.

Varieties for trial: Eastman, Evelyn, Windsor Chief, Gilbert, Superb.

CRABS AND HYBRIDS.

For general cultivation: Florence, Whitney, Early Strawberry, Sweet Russet, Transcendent.

Varieties for trial: Faribault, Dartt, Success.

PLUMS AND HYBRID PLUMS.

For general cultivation: De Soto, Forest Garden, Wolf (freestone), Wyant, Stoddard, Terry, Surprise.

Most promising for trial: Compass Cherry, Hanska, Opata, Sapa, Stella, Waneta, Omaha.

GRAPES.

First degree of hardiness: Beta, Janesville, Hungarian.

Second degree of hardiness: Moore's Early, Campbell's Early, Brighton, Delaware, Worden, Concord, Moore's Diamond, Wyoming Red.

Red varieties: King, Sunbeam, Miller, Loudon, Minnetonka Ironclad.

Black and purple varieties: Palmer, Gregg, Older, Columbian, Cumberland.

BLACKBERRIES.

Ancient Briton, Snyder, Eldorado.

CURRANTS.

White Grape, Victoria, Long Bunch Holland, Pomona, Red Cross, Perfection, London Market.

GOOSEBERRIES.

Houghton, Downing, Champion, Pearl, Carrie.

STRAWBERRIES.

Perfect varieties: Bederwood, Enhance, Lovett, Splendid, Glen-Mary, Clyde, Senator Dunlap, Minnesota No. 3.

Imperfect varieties: Crescent, Warfield, Haverland, Marie.

Everbearing varieties: Progressive, Superb.

ORNAMENTAL FRUITING SHRUBS.

Valuable for trial: Dwarf Juneberry, Sand Cherry, Buffalo Berry, High Bush Cranberry.

NUT FRUITS.

Shellbark Hickory, Black Walnut, Butternut.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2641 Humboldt Avenue So. Minneapolis.

December 6th, 1916.—The Minnesota Garden Flower Society has just completed a most busy and profitable year. We have a paid membership of 174 and two honorary members. Sixty-eight of these are new this year. Analyzing our membership list we find sixty-two live in St. Paul, sixty-nine in Minneapolis, nine belong to the Nemadji Club, thirty-four are scattered outside the Twin Cities. Thanks to Mrs. Boardman, we have one member in Chicago and two in Pennsylvania. So our fame is spreading. Sixteen have already paid dues for 1917.

Our program committee issued the year's program early. It was planned to have a meeting each month, alternating between St. Paul and Minneapolis. There have been six program meetings during the year; two in Minneapolis, three in St. Paul and one between the two, at the Agricultural College. One informal flower show, held in Minneapolis, May 22nd; the big June flower show with the Horticultural Society, June 23rd; two garden meetings, both in Minneapolis; and a greenhouse meeting.

At the president's suggestion, the experiment of serving tea and cakes, after the indoor meetings, has been tried with great success. In no case has the expense exceeded 50c, and the pleasure and sociability of the meetings has been greatly increased. The club owes thanks to the social committees of the two cities for this service, since it has meant quite a bit of work for them.

A garden photographic contest is being held now. Six contestants have entered photographs. Prizes are to be plants, given by Mrs. Sawyer, Mrs. Tillotson and Mrs. Gould.

Our page in the Horticulturist has been kept up by Mrs. Gould, our president; and she is to go to Des Moines as the delegate from the Horticultural Society to the Iowa Horticultural Meeting.

Seeds were given to members at the March meeting and the September meeting.

The club is under obligations to Mr. Theodore Wirth, and Mr. Meyer, of the Minneapolis Park Board, and to Professor Cady, of the Agricultural College, for the seeds given out in September and for many other courtesies.

We have published no leaflet this year, but instead have given each member a copy of Mrs. Boardman's "Pronouncing Handbook."

Our society has been asked to give one day's program at the "Farmers' Short Course," given at the Agricultural College the first week in January. Our day will be January 6th.

Miss Anne McKibbin has offered us the use of about seventy lantern slides showing Italian gardens, which will probably be used then.

Through an arrangement with Secy. Latham, it has been possible for us to give plant prizes to our members, for securing new memberships.

There have been no formal papers given at our meetings during the year.—Mrs. M. L. Countryman, Secy.

The January meeting of the society will be held January 6 at the Farm School, Room 20, Horticultural Building, at 10 a. m. and 1:15 p. m. Lunches can be procured on the grounds. We hope this meeting will be largely attended.

The year's program, we trust, will be ready for publication in the February Magazine. Watch this page for it.

Our meetings during 1917 will alternate between St. Paul and Minneapolis as heretofore and will be held on the second Friday of each month, exceptions being noted on this page.

Our Nemadji branch has had a most active and successful year, having held fourteen meetings, one of which was a banquet at which the husbands were entertained. Flowers were sent to hospitals and members' gardens visited by the society. This shows what a civic and social asset a branch in any of the smaller cities may become. Nemadji, we feel very proud of you and wish we had many branches doing the splendid work you are doing!

SECRETARY'S CORNER

Competition for the $1,000 Prize.—Another competitor has appeared for the $1,000 seedling apple prize offered by this society, Mr. Arnt. Johnson, of Viroqua, Wis., the seedling entered being grown from seed of the Malinda planted nine years ago. It is claimed to be a long keeping winter apple, even into June. Scions will be sent for testing to the fruit-breeding farm.

Valuable Seedling Apples.—Amongst the various seedling apples exhibited, and to which prizes were awarded at our late meeting, were three that the judges decided were of sufficient value to ask further information about and endeavor to secure from them scions for testing at the fruit-breeding farm. These are known as Nos. 17 and 19 by J. A. Howard, Hammond, and a seedling without name or number from Wm. Schmidt, Excelsior.

Our Representative on the State Forestry Board.—One member of the State Forestry Board is appointed on recommendation by this society. Hon. Henry C. Oldenburg, of Carlton, has occupied this position for a considerable time, and upon the solicitation of the officers of the board the executive board of this society endorsed his reappointment as our representative.

Minnesota Crop Improvement Association.—This state organization will hold its annual meeting in the Fairmont High School building, February 13-15 next. A large exhibit of corn is assured. It may be that some of our members will desire to attend this meeting and take part in this competitive display. If so, they should address the Secretary, Prof. C. P. Bull, University Farm, St. Paul, Minn., for full information.

See the Pink Slip.—Please do not fail to note the pink slip inside the front cover page of our monthly. Whether you have paid membership fee or not you will be interested in reading this over. It is our present plan to place this slip in every issue of every magazine sent out during the year. As it will be changed from time to time to keep abreast of the movement of the society it might be well for the member to read this month by month.

Delegates to Iowa and Wisconsin.—This issue of our monthly contains the reports of the delegates to the Iowa and Wisconsin State Horticultural Societies, both of which meetings were held at the same time, December 12-14, the week following our annual meeting. As these societies are so closely akin to the Minnesota Society in the character of membership and the kind of work being done, we have a special interest in them as co-workers and are glad to come in touch with them in this fraternal way.

Are You a Member of the Present State Legislature?—If so, will you not please write to Secretary Latham promptly to that effect. In the effort about to be made to secure from the State Legislature a home for the society we should like especially well to interest directly those members of our society who belong to the present legislature. As this notice may escape the attention of some member of the legislature, will not other members of the society who know of any of our membership who are in the legislature notify Secretary Latham also to that effect?

MEETING OF THE SOUTH DAKOTA STATE HORT. SOCY.—As we go to press the date and place of meeting of this society are not yet known, but any one interested in finding out might address Prof. N. E. Hansen, Brookings, S. D. Prof. Hansen, always in attendance at our meeting, is secretary of that society, which fact alone insures an interesting program. The representative of this society at that meeting will be Mr. M. R. Cashman, of Owatonna, from whom we may expect an interesting report in the February number.

WHO SHOULD BE MEMBERS?—We are very ambitious to reach more people with the work of the society and do more good, and there surely must be some of your acquaintances, dear fellow member, who would be profited by a connection with this society. Won't you please send to Secy. A. W. Latham, 207 Kasota Blk., Minneapolis, Minn., on a postal card, a list of such friends and acquaintances, either near or far, whom you would like to nominate for membership in this society, and the secretary will do his best to secure their names on our membership roll. Such co-operation as this in some form is absolutely necessary to insure success in our purpose to enlarge the field in which the society is operating, and we feel assured of having it.

FRUIT AND VEGETABLE SHIPPERS VIOLATE LAW.—Inspectors have found several interstate shipments of packages of fruits and vegetables, such as grapes, tomatoes, and berries, which contain no statement on the packages as to the quantity of contents. The net weight amendment to the Federal Food and Drugs Act requires that all packages of foods which are shipped into interstate or foreign commerce must be marked plainly and conspicuously with a statement of the quantity of the net contents, either by weight or measure. Shippers who violate the law by failing to mark the quantity of the contents of each package of fruits and vegetables they ship into interstate commerce are liable to criminal prosecution. Several shippers have already been cited to hearings under the Food and Drugs Act for violating its provisions in this respect.

AUXILIARY SOCIETIES AT THE ANNUAL MEETING.—Aside from what societies were spoken of incidentally in the brief report of the meeting, to be found on the first pages of this issue, there were also with us meeting in the same building at various times during the week, the Minnesota Bee-Keepers' Society, L. V. France, Secy., University Farm, St. Paul, and also two other newly organized ocieties, the Minnesota Ginseng Growers' Association, F. C. Erkel, Secy., Rockford, Minn., and the Northwest Peony & Iris Society, F. C. Christman, Secy., 3804 Fifth Avenue South, Minneapolis. All of these associations are in a flourishing condition and doing the best kind of work along their respective lines. For the convenience of those of our membership who would be interested to become members of these auxiliary societies the addresses of the secretaries have been given, with whom you could communicate.

A JUNIOR HORTICULTURAL SOCIETY.—As the result of a conference between the officers of this society and the extension workers at University Farm an arrangement has been made which is likely to result in the organization of a Junior Horticultural Society, to be made up of such members of the Minnesota Boys' and Girls' Garden and Canning Clubs throughout

the state as would be interested to receive our literature, plant and seed premiums, and contest for prizes to be offered for best work along their club lines. It is planned also to offer to these young people in a general way the expense of a visit to the next annual meeting of the society for the ten ranking members in a prize contest, five of whom will appear upon our program in recital of their experience in growing and canning garden products. The details of this plan are not yet fully worked out, but undoubtedly will be without difficulty as the movement develops.

HORTICULTURAL PROGRAM AT UNIVERSITY FARM.—Farmers Week at University Farm, located at Midway between Minneapolis and St. Paul, this year will be January 1-6. Every branch of agriculture will be given attention at this gathering. The large corps of professors and instructors at the Farm School, assisted by practical workers in the field, make up a course of study almost ideal. We hope that many of our members may have the opportunity of spending the week at the Farm and secure the fullest benefit from this splendid service.

Horticultural subjects will be discussed as follows: Orcharding, Tuesday, January 2, 1:15 to 4:00 p. m.; Small Fruit Growing, Wednesday, January 3, 1:15 to 4:00 p. m.; Vegetable Growing, Thursday, January 4, 10:00 a. m. to 12 noon, 1:15 p. m. to 4:00 p. m.; Garden Flowers, Friday, January 5, 10:00 a. m. to 12:00 noon, 1:15 p. m. to 4:00 p. m.

Lunches can be had at the boarding hall there, and to a limited extent we understand those in attendance can find accommodations for the night as well.

GIDEON MEMORIAL CONTEST 1916.—There were four students from University Farm who delivered addresses at the annual meeting as contestants for the prizes awarded in connection with the Gideon Memorial Fund. The following three students were successful in this contest, viz.:

Robert McGowan, School of Agriculture, first prize, $12.00. Subject, "The Codling Moth."

Henry Kaldahl, College of Agriculture, second prize, $8.00. Subject, "Roses for the Border."

Robert C. Shaw, College of Agriculture, third prize, $5.00. Subject, "Windbreaks."

These addresses were given before an audience of about one hundred fifty members of the Horticultural Society, were all well rendered and proved to be a very interesting feature of the meeting.

The following gentlemen acted as judges:

Prof. F. W. Broderick, Winnipeg, Man.

Prof. N. E. Hansen, Brookings, S. D.

Prof. Thomas McCall, N. W. School of Agri., Crookston.

THE PROPOSED HORTICULTURAL BUILDING.—On page six of this number will be found an article descriptive of the horticultural building which it is hoped to secure from the action of the present State Legislature, and a brief account of what has been done so far to bring this about. The attention of every member of the society is especially called to this subject, and particularly so as an appeal will soon be made to the membership to use their utmost endeavors to secure action on the part of their representatives in the legislature favorable to this end. The plan as at present developed contemplates the erection of this building on that part of the University Farm grounds which is near the Como-Harriet street car line, so that our meetings and exhibitions may be readily accessible to the thousands of attendants, young men and young women, at the Farm School, and further that the Farm School may have the advantage of the use of the splendid halls this building contains for any useful purpose connected with their work at such times as the Horticultural Society does not need them. Some agreeable co-operative arrangement will be made between the Horticultural Society and the management of the University Farm looking to these ends. Think of this matter, dear fellow member, and plan to render all the assistance possible that this first year following the semi-centennial celebration of our society may see it provided with a suitable home, to which the splendid work of the society fully entitles it.

BERRY PICKING IN A BLOCK OF JUNE-BEARING STRAWBERRY NO. 3, AT THE MINNESOTA STATE FRUIT-BREEDING FARM, EXCELSIOR, MINN.

Supt. Haralson standing at the extreme left. (See opposite page).

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 FEBRUARY, 1917 No. 2

Minnesota State Fruit-Breeding Farm in 1916.

CHAS. HARALSON, SUPT., EXCELSIOR, MINN.

December 5, 1916.—Owing to peculiar and unusual conditions during last winter and spring, a large per cent of the fruit buds on plums were killed more or less, and this applies to the native plums nearly as much as to the hybrids. Some trees blossomed quite freely but were in a rather weak condition to set fruit, which accounts for the small crop of plums. However, some varieties bore a light crop of good fruit, and we had approximately seventy bushels of plums; with a fair crop we should have had several hundred bushels.

Apples were also a light crop, and standard varieties as well as seedlings bore very little. Fruit was not up to size and crippled to a great extent, even where thorough spraying was done.

Small fruits such as strawberries, raspberries, gooseberries and currants were up to the usual standard and bore one of the best crops we ever had, and the fruit was large, perfect and firm. The weather was fine during the ripening season, with plenty of moisture all through the strawberry season. At the first two pickings, with careful sorting and packing twenty-seven berries would fill a quart box in good shape.

A great many improvements have been made at the Fruit Farm during the past two years. A substantial and comfortable modern living house has been built at a cost of approximately $4,000, an addition to the greenhouse 20x100, a steel water tank with seventy-five barrel capacity for water supply, a machine shed 20x30. A sewer and drainage system has been installed, which was very much needed. The old farm house has been made partly modern.

The grounds about the buildings have been improved to some extent by planting shrubbery, a collection of roses, peonies, iris and several other varieties, all planted last spring.

Plant breeding has been carried on, mostly with apples the last year, and from the results of this work we have a quantity of seed saved for planting next spring. The varieties used in these combinations were Hibernal, Duchess, Wealthy, Okabena, Windsor Chief, Jonathan, Grimes Golden, King David, Delicious, Fallawater and several other kinds.

Topworked trees of some of the best seedlings and standard varieties have made a rank growth this summer and are in good shape for a crop another year. There was no blight during the summer, and apple trees of all kinds are in a good healthy condition.

Minnesota No. 3 strawberry made a good showing this year again and is probably one of the best commercial varieties to plant in Minnesota. The plants are hardy, very productive, and it is an all around good market berry. In our final selection this year of strawberries we have several varieties that are equal to Minnesota No. 3 and probably will prove better in some respects, namely, Nos. 920, 924, 935, 758, 1228 and several others. One of these new varieties will be sent out for trial next spring.

Minnesota No. 1017 everbearing strawberry has done better than any other variety, Progressive included, at the Fruit Farm this summer, but reports from other places would indicate that the foliage rusts badly and therefore is not adapted to all kinds of soil and locations. This variety has been way ahead of anything else for a number of years at the Fruit Farm.

Out of 3,000 everbearing strawberry seedlings about 200 were selected a year ago last summer, and among these we hope to get some valuable varieties as soon as we can make the final selections.

In Minnesota No. 4 raspberry I think we have one of the best commercial varieties to plant in Minnesota. The plants are hardy, make good strong canes, are resistant to disease, propagate very rapidly and are very productive. Its season is about a week later than the King, berries large and dark red, stand up well in shipping, and it is an all around good market berry. Minnesota No. 1 raspberry is a week earlier than No. 4, berries much the same and reported by some fruit growers to be satisfactory in every respect. It will not make quite as many canes as No. 4, which probably is an advantage to some growers, as it is less work to thin them out.

We have two varieties of everbearing raspberries which I had not paid much attention to until a year ago. They fruited last fall a year ago and again last fall. These two varieties are promising, plants are productive and berries large. Stock is being propagated for distribution later on.

Two varieties of grapes are being propagated as fast as material will permit. They are both seedlings of the Beta grape. One is a red grape about the size of Wyoming Red, the other is black and about the same size. The vines are hardy and rank growers, fruit equal to commercial varieties in quality.

The plum hybrids were a disappointment this year, some varieties bore a light crop and some no fruit at all. Burbank X (crossed with) Wolf, Nos. 4, 6, 9 and 21 did the best.

Of the new hybrids which fruited this year for the first time I will mention óne especially. It is a cross between the sand cherry and apricot. This seedling bore a fair crop this year of medium sized fruit, or about the size of the De Soto plum, fruit almost black when ripe with purple flesh, very small pit, fruit firm and quality good when fully ripe. This is the first one of the apricot hybrids that has proved of any promise. Another one is a cross between Compass cherry and Satsuma plum. The fruit of this is of fair size, good quality, color purplish blue with purple flesh.

Minnesota No. 3. Exact size.

Several hundred second generation seedlings, supposed to be from a cross of Compass cherry and pin cherry, fruited heavily this year but were not of much value with the exception of one, which has a black cherry, very firm and of good quality, the size of a Bing cherry.

The tree grows more of a bush form than a tree, and the fruit ripens about first of August. If this variety proves hardy it may be of some value in some locations for its fruit and also for ornamental purposes. Another hybrid which fruited this year is Compass cherry with Climax plum, one of Luther Burbank's introductions. Fruit dark red color, with green flesh, medium size and fair quality. This tree is an upright grower and without thorns; it is hardy and makes a fine tree. It was sent out as premium last spring to some members. Other hybrids fruited more or less but will require more time before I can report on them.

Among several thousand gooseberry and currant seedlings fruiting this summer we have selected about 200 plants for propagation in a small way for further trial. All bushes not coming up to a certain standard have been discarded, dug up and burned, to make room for other plantings later on.

A block of about four acres were planted to approximately 6,000 apple seedling trees last spring. These were grown from seed of N. W. Greening, Wealthy, Scott's Winter, Bethel and other varieties—seed secured from D. C. Webster's orchard at La Crescent, Minn., also from a quantity of seed from our own plant breeding work.

We had very little fruit from the Malinda seedlings, planted some eight years ago. However, a few trees bore some very promising fruit of good keeping quality, and among them is one highly colored, of fair size and a good keeper, quality very good. The interesting part of it is that the apple is pink clear to the core.

New fruit plants to members of the Horticultural Society were sent from the Fruit Farm last spring, consisting of hybrid plums, Minnesota No. 4 raspberry, No. 3 strawberry, No. 1017 everbearing strawberry. I have no record of how many plants were sent, but they ran up into the thousands. We ran short of plum trees and No. 4 raspberry, and No. 1 raspberry was substituted where members had more than one lot of the No. 4 raspberry, and it was also substituted for plums in some cases.

Some of the new strawberries were exhibited at the horticultural summer meeting last June, also plums, grapes and some seedling apples at the State Fair last September.

The President: I know you will want to ask Supt. Haralson some questions about these interesting things that he is working with. I was going to ask him if he has done anything with the cherry.

Mr. Haralson: I did quite a little last spring with both the sour and the sweet cherry crossed with the Compass cherry,

and we have quite a bit of seed for planting in the spring. I am going to work it pretty hard another year.

Prof. Waldron: We have some notes on Minnesota No. 3 as compared with fourteen other varieties of strawberries for the year 1916. It was a poor year, very wet, a cold spring, and the highest yield we got was at the rate of 4,000 quarts per acre. That is very big for strawberries, as you know. The Minnesota No. 3 led the list, at 4,042 quarts per acre; Haverland, second, 3,742; Perfection, third, 3,358 quarts; Brandywine, fourth, 3,232; Fendall, 3,000; Warfield, 2,851, down to Dunlap .

Mr. Clausen: I would like to ask if Mr. Haralson has any reports about No. 1017.

Mr. Haralson: No reports especially. The only point I heard about it was that some people claimed it had rust and was not satisfactory on that account. Of course, this year was rather trying, and it might do better another year. As far as fruiting is concerned it has given satisfactory results.

Mr. M'Broom: There are quite a number who have difficulty with the 1017. It is rather erratic. I know with me quite a lot of my plants didn't make a runner, and others spread over a lot of ground. It is a matter of soil and location. I would like to know what location is suitable for that plant.

Mr. Gardner: I want to say that I set out some of the 1017 this spring on my place, set them out in a patch where I had fifteen or twenty other kinds. I would take people through there, and there was not a time that ever I took anyone down across that row but what we found nice berries on those little plants. Quite a number spoke about having blight; I haven't had a single case of it.

The President: Mr. Gardner has rather a heavy black soil.

Mr. Gardner: Where these berries are it is first class limestone soil, and where that patch stands it is down ten feet to solid rock. All that land is limestone soil except on the east side it slopes off into black soil prairie, so we have a few acres of black soil prairie land. There wasn't any blight on that plant. There is only one thing that didn't strike me favorably. I don't exactly like the looks of the berries—the shape of them. If they were as large as they are and shaped like the Progressive I would like them better.

Mr. Clausen: I have been growing it for a couple of years, the 1017, and I haven't found it bothered with rust at my place. I had it on different soils, but I think the way to grow it is in hills. I have grown some in hills this summer, and they gave me lots of fruit, probably more than most of them. I feel like saying to the horticulturists here, don't be too quick to condemn a new kind of fruit until you try it thoroughly. That is the trouble with a good many of us, if they don't do good one year we give them up. I want you to try until you are sure.

Mr. Kellogg: My boy had this 1017 growing for two years, but the last year the drouth was so severe that all his small fruit failed, and I cannot make a good report, but from what I saw at the farm it is ahead of anything we have ever had. I have great faith in it.

Mr. Bartlett: We have been raising the 1017 for two years now, and I have noticed the same tendency with it which Mr. McBroom speaks of, that is, a tendency of part of the plants to produce runners and part of them fruit. I have found that part of them would send out a lot of runners with no fruit at all, and some of them almost killed themselves before the end of the season bearing. I have noticed the same tendency near our place and also at the Fruit-Breeding Farm. I think one thing which we ought to keep in mind in connection with that fruit is the fact that it is a very heavy feeder and requires more fertilizer than the other everbearing varieties, and possibly if we gave this phase of the situation the right amount of attention we would overcome the tendency the plant has of killing itself by overbearing. I don't think too much can be said in favor of the No. 3 strawberry or the No. 4 raspberry. We have tried them out extensively on our place, and they have given the best of results, and I believe there is no question but what the No. 3 strawberry will supersede the Dunlap strawberry, and the No. 4 raspberry will very soon take the place of the King and the other varieties which we have been growing.

New variety of June-bearing Strawberry No. 937. Exact size. To be sent out next spring for first time.

Prof. Beach: The No. 4 raspberry grown at Ames, plants sent us by Supt. Haralson, we find hardy and vigorous and productive and the fruit holds up well. It evidently would be a good market variety, of good flavor.

Mr. Husser: We found the No. 3 strawberry to be a very healthy plant; the berry stands up very well, nice, bright color, and they are solid, but I don't think they come up in production to the Senator Dunlap. But that will not discourage us to keep them another year or two. Maybe the peculiarity of the

season has something to do with it, so that it didn't produce as well as the others. We had some rust in parts of some rows and not in other parts of the same rows. We think that was due to the water. It is where the water didn't run off so good in the spring time that we had the rust.

Mr. Black: I am inclined to think that in testing these new varieties we lose sight of one thing we should take into consideration, and that is the difference in the soil and also the cultivation and the different treatment that they get. I realize from my own experience in testing strawberries we must take that into consideration.. A year or two ago I had Progressives in two different places. They were the same kind of plants. In one place they made an abundance of plants, in the other place it was the exception where the plants threw out runners, but, as one speaker has said, they almost bore themselves to death with berries where they didn't throw out runners. I am satisfied that was brought about by the condition of the soil. When it comes to the comparative yields of the different varieties we must take into consideration this difference of soil. I have had Dunlap on quite heavy soil where it did fine. When the variety was first introduced I condemned it for a number of years; I had planted it on light soil and it didn't do so well. In fact, the first year it was almost a failure as to yield, but the second year it made a pretty good yield.

The President: What variety of all the plums that you have originated do you regard the most promising for general cultivation in our state?

Mr. Haralson: Well, as far as I know, the No. 6 and the No. 12 are the best. There are some others that may be just as good. I intend to make a final selection, though, but I want to hold it off another year.

Mr. McBroom: In regard to the strawberry question I want to explain that I had a rather heavy soil, very heavily manured, before planting the No. 1017. Right beside them on the same soil I had the No. 3. They made a heavily matted, fine looking green row of new plants. While the No. 1017 did what I said, they didn't do as well as the No. 3.

The President: No. 3 seems to be making good so far as I have heard from it.

Mr. Arrowood: I have been planting No. 3 strawberries I got from Mr. Haralson about two or three years ago and they have been doing splendidly; nothing better for a June plant. The No. 1017 didn't make runners with me; I planted them in hills, but they are great bearers; they bear well. We have a few hills, and we send them out to the agricultural departments of our schools, and they are planting them in pots, keeping them in the class rooms. They report they are doing fine and will bear in the house. We have a plant in our house that has got fifteen or sixteen ripe berries on it. The No. 4 raspberry is one of our best berries. We have almost half an acre and got a large crop, and the berries sold at 20 cents a quart right on the ground. Our soil is what we call jack pine soil, rather high land. It is a sandy loam with a heavy hardpan about two feet down.

Annual Examination of Minnesota State Fruit-Breeding Farm for 1916.

J. F. HARRISON, EXCELSIOR, S. A. STOCKWELL, MINNEAPOLIS, COMMITTEE.

At the request of Mr. Latham, our secretary, the undersigned visited the Minnesota Fruit-Breeding Station at Zumbra Heights as a committee of inspection for this society on September 16, 1916.

As is known to all of us, the past summer was one of unusual severity on all kinds of fruit. We had a very wet, backward spring followed by the most severe drought that ever visited this section of the state. Consequently, the work at the Breeding Station has been very seriously handicapped. Nevertheless much has been accomplished.

We found that the farm consists of seventy-eight acres; sixty-five acres are under cultivation and planted to various kinds of fruits and berries. The remainder of the farm is used for a meadow, and there is some timber still standing. There could be used to very great advantage at least twenty acres more of good land, and we earnestly urge the incoming State Legislature to provide the necessary means to obtain this land while it can be had for a reasonable price. We think it is not too much to say that the state's investment in a fruit-breeding station will repay any outlay that the state may make.

The last legislature made an appropriation for a superintendent's dwelling, at a cost of about $4,000; a steel water tank, a sewer system and an additional greenhouse. The greenhouses are, of course, necessary for plant breeding during the winter and early spring.

It is the practice of the superintendent to start about the first of January to force the blooming of the plants he desires to breed. This lengthens the season for breeding purposes very materially.

Something like 6,000 apple seedlings were planted last spring for fruiting. As is known to the society, the fruits that are developed at the station are sent out (for testing) to the members of the society. Of course, there are a great many trees and plants discarded as worthless.

They have at the present time close to 40,000 seedlings of various fruits growing on the place.

Mr. Haralson, the superintendent, thinks he has a very wonderful everbearing strawberry in Minnesota No. 1017. It

has been sent out to various members of the society, who undoubtedly by this time will have determined its merits.

Minnesota No. 3, a June bearing strawberry, ranks among the very best. It is being sent out as fast as it can be produced. There are other varieties coming on which promise well.

Minnesota No. 4 is a raspberry of great promise. It is hardy and large and very productive.

New residence of superintendent at State Fruit-Breeding Farm.

Reports from Minnesota No. 1 (raspberry) are gratifying.

Two varieties of everbearing raspberries are to be sent out for trial as soon as enough stock is produced. They have as yet not been given a number.

Some excellent plums have been developed, the best varieties of which are Nos. 6, 9, 10, 12 and 21.

A number of excellent varieties of grapes are coming along satisfactorily.

Beside the above the superintendent has a number of promising gooseberries and currants.

We found the station in good condition. It is wonderfully well cultivated, and everything about the place indicates intelligent and orderly administration.

The station is exceedingly fortunate, we believe, in its superintendent, Mr. Charles Haralson. We are confident that his work for the state will be unsurpassed by any other of the excellent men who are doing so much for the world by breeding new and better varieties of fruit.

We urge upon the society and the legislature most cordial and sympathetic support in every way of Mr. Haralson's work.

Mr. Stockwell: I want to express my appreciation of the work of this society; I have mentioned it on one or two occasions before. I am a native of Minnesota, my father was a New England farmer, a New York school teacher and came to Minnesota in 1856. One of the things that these pioneers suffered most from was the lack of fruit. They used to send to Massachusetts and get barrels of apples in the fall at great expense, and then they were doled out to us boys as long as the barrel lasted. My father spent hundreds of dollars trying to introduce fruit onto his Anoka county farm without success, and it was our opinion, and the opinion of people generally, that Minnesota could never be a fruit state. Now, less than fifty years after, I am sent as a delegate and member of this Horticultural Society to inspect the fruit-breeding station that is doing such wonderful things for the state of Minnesota. To my mind the work that has been done by this society is of higher consequence to the state of Minnesota than all the work of all the empire builders, financiers and captains of industry that the state has ever had. (Applause). I never come to these meetings and look at the vanishing old guard without a feeling of sorrow and also a feeling of gratitude for the splendid men and women who have made Minnesota a fruit growing state, because to my mind when we are really civilized we will eat more fruit and grow less of other things and we will cut out alcohol entirely. (Applause).

The President: I think we all agree with Mr. Stockwell that Superintendent Haralson is one of the most useful citizens of the state of Minnesota. (Applause).

$300,000,000 A YEAR WASTED BY WEEDS.—According to the United States Department of Agriculture, the annual waste due to weeds is estimated at $300,000,000 for the whole United States. In certain states where diversified farming is the exception and not the rule, the waste is said to approximate $40,000,000 per year. What the waste is in Colorado cannot be accurately estimated but it is undoubtedly true that considerable waste occurs. In the intensively cultivated sections the waste is not very large because of the clean culture needed for certain crops. In sections where grain crops are very popular, the waste is quite large.

The principal ways in which weeds affect farming are through direct damage to the crop, cutting down the yield, cheapening the product, and lowering the value of land.—J. D. Marshall, Colorado Agricultural College, Fort Collins, Colorado.

A Successful Cabbage Field.

E. C. WLLARD, MARKET GARDENER, MANKATO, MINN.

Friends have told me that I make a mistake in selling plants and in telling how I do things. But for several years one of my specialties has been early tomatoes. Every year I have sold plants and told how to get them to fruit early, and still our income from plants and fruit grows larger each year. So I conclude that, while there may be some loss through the competition of my customers, it is not as great as some people imagine. Moreover this paper is not addressed to the men who would grow ten, twenty or forty acres of cabbages, but to the one who might grow a few dozen or hundred for his own use.

E. C. Willard and daughter Julia.

The matters of first importance are seed and soil. Buy the best cabbage seed you can find. If you cannot find out what is the best any other way, test it. Get supplies large enough to last you two or more years from two or more reliable seed houses. Plant some from each lot, note which gives the best germination, the best plants, the heaviest yield, the freest from rot in the field, and the best storage properties if stored.

The ground for cabbage should be manured and plowed in the fall or early spring and cultivated every ten days until setting time. The seed for early varieties may be planted in hotbed or greenhouse or boxes or pans and set in the light of a sunny window in the dwelling house in February or March. Care must be taken that the plants have light enough and not too much heat or they will grow spindling. The stockier the better. As soon as the plants show their first true leaves they must be transplanted about one inch apart in flats or beds, and as soon as the

weather permits they can be set in the open ground. While the plants are in greenhouse or hotbed careful attention must be given to watering and ventilation. They should be watered sparingly and should be ventilated every warm, sunny day, and also on cloudy days if the beds are warm enough. Too much water and too close an atmosphere cause spindling plants, also they are conditions which are favorable to the growth and spread of diseases, and the plants so grown, being soft, are very liable to disease.

Before the plants are taken from hotbeds they should be hardened by exposure to the outside air. The sash should be left off both day and night, but can be put on in the case of a very cold night.

Seed for the late crop should be planted May first, either by hand or with a garden drill, in soil which has been put in as fine mechanical condition as possible with a rake or with a smoothing harrow and plank drag. As soon as the young plants come up they should be cultivated with a wheel hoe or other tool and thereafter every ten days or two weeks.

In June the plants should be dug and set. It is better done by the twentieth, although some seasons later planting will do. We prepare the ground as for a seed bed, then mark both ways thirty or thirty-six inches by twenty-one for Holland or Danish Ball Head. Then, if a wet time, we make holes at the intersections with a dibble or even with the hand and set the plants. If it is a dry time or not likely to rain within a few hours, we can set with a hand machine which waters as the plants are set. Care must be taken to pack the dirt about the roots with the feet as one moves along the row. Plants to be set this way should be straight and not over large. If we set by hand we must first make holes with the dibble, then pour a little water in the holes, then set the plants quickly before the water all disappears if possible. A man can well do the setting and two boys the other work, including the digging of plants. If the field is large, the best way is to use a two horse planter. This requires a driver and one or two boys to drop plants into the machine. This must be the cheapest way to set, and, while I have never used a horse planter, I think, from observation, it is the best way. Fields set this way seem more uniform than hand-set fields. The secret of it is this. In setting with water, the settling away of the water brings the roots and fine soil closely together and makes the plants ready for a quick start. In hand setting with water one does not get the conditions just right.

Your cabbage will not do much if not started right, and, to repeat, there are four important points, soil prepared as for a seed bed, good plants, moisture and the packing of the earth closely about the roots.

If the ground is dry, or as soon as it is dry, the plants should be cultivated, and after that every week or ten days. They will respond well to hoeing, but usually it is not necessary to do much hand hoeing. If while the plants are still small, they are hoed with the wheel hoe once or twice across the rows, hand hoeing will be eliminated. Cultivation with the rows can be done with a wheel hoe if the plot is small. If the plot is larger it can be cultivated with a horse and five-shovel and fourteen tooth cultivator.

We have never considered it necessary to spray our cabbage, but many do, and it is better to do it. For the aphis, spray with kerosene emulsion, for green worms use paris green or arsenate of lead.

We have never used commercial fertilizers, and so can only advise regarding barnyard manure. Use it freely, as the cabbage is a gross feeder.

Apple Storage.—The results of the investigations in the handling of northwestern apples for and in cold storage have been so consistent and conclusive that this phase of work may be considered completed. The results brought out particularly the importance of picking apples of various varieties at the proper stage of maturity, of careful handling in all harvesting and storage operations, of prompt cooling, and proper storage temperatures. During past seasons the growers have frequently suffered very large financial losses from either too early or too late harvesting of apples of certain varieties, such as Jonathan, Rome Beauty and others. The work has demonstrated clearly that the storage life of apples can be prolonged from weeks to months by picking at proper maturity, and has shown how the grower may know when his fruit is of proper maturity for best results in storage. In connection with the investigations of the cold storage of Yellow Newtown apples in the Watsonville district of California, the most important discovery is without doubt the relation of tree vigor to the keeping quality of fruit in storage. Experiments extending over two seasons have clearly shown a marked and consistent difference in the keeping quality of fruit from different trees, particularly trees that for any reason differ in vigor and general healthfulness. During the past season the possibilities of common, or air-cooled, storages in different sections were carefully investigated. The results of these investigations have clearly shown the practicability of such storage under some conditions and the economic saving resulting to the industry in the use of houses properly constructed and managed.—U. S. Dept. Agri.

Everbearing Strawberry Field.

A. BRACKETT, FRUIT GROWER, EXCELSIOR, MINN.

Mr. Brackett: I wish to say a few things about something that came up before I start on everbearing strawberries. I have had at least fifty years' experience in growing strawberries, and I don't think it would pay to try to irrigate strawberries in Iowa or Minnesota. I know a gentleman, and a great many of you no doubt know him, out at the lake who has spent hundreds of dollars putting in an irrigating plant that he never got a dollar from, and it stands there idle today. I know this, that strawberries very often are injured in the winter by root killing and will only bear one crop of berries, that is, just one picking, and then they will dry up. In my first experience with that root killing I thought it was the drought, and I tried irrigating, but I couldn't revive those plants. If your strawberry plants have gone through the winter and have roots that are perfect, haven't been injured by winter, I have never seen a year so dry in Minnesota but what they would mature a crop of berries if the ground was well fertilized and well mulched. The expense of irrigating, no one appreciates that until he has tried it. You have got to keep that up all the time. Lots of years you won't need it. This year during the severe drouth it might have been a small advantage on the everbearing; I know of one irrigating plant at Excelsior; I don't think the man got any benefit from the use of that.

Now, we can't say whether a crop of strawberries or a crop of corn or any other crop will pay us by just one year's experience. If that was a fact the corn raisers of Minnesota in 1915 would have told you that corn did not pay. It wasn't a paying crop that year. The wheat raisers in Dakota, many of whom didn't cut their grain, if they should base their opinion on this year's crop would tell you it doesn't pay to grow wheat. We have got to take several years to decide on whether it is a paying crop or not. There are no doubt lots of people who have tried everbearing strawberries, and if you should ask them now whether they thought it would pay they would tell you no. For some reason they didn't get any berries; I know lots of them didn't get berries enough to pay for the plants, but it wasn't the fault of the everbearing strawberries.

You don't need to irrigate the strawberry plant if you handle it right. Now this year I anticipated it might be dry, and as a precaution I mulched my strawberry bed in the fall of the year, and I mulched it heavily. Some people will say, "You smother your strawberries out." For the last fifty years I never saw any strawberries smothered out. Last year if they would smother out mine would have smothered out, because we covered them heavily with slough hay, and then I put on fifty loads to the acre of stable manure. Then we had two or three feet of snow on top of that last year.

The present season of 1916, with the severe drouth in the latter part of the season, has been very hard on a great many

fields of everbearing strawberries, which goes to prove that you cannot decide by one year's test as to the profit of any particular crop. Beds of strawberries that were on rather poor ground and not mulched or cultivated proved a failure in our locality. The spring was very favorable, having plenty of moisture, and it looked very much as if there would be a large crop, with a probable price of about 10c per quart, but on account of the drouth the crop sold readily at $3 per crate of 24 pints.

There is no question in my mind as to the everbearing strawberry taking the place to a great extent of the June bearing berries for home use or commercially. They require a different culture from the June berries to carry a crop during the entire season. I will give you my mode of handling them, which has been very successful this summer. I was quite certain that if we had a dry summer the berries would be few and small, and I prepared for it by mulching heavily with slough hay quite early in the fall. I then gave them a coat of stable manure from the horse barn, on top of the hay, at the rate of fifty loads to the acre. I am well aware that some of you will say there will be danger of smothering the plants, but in my lifelong experience I have never seen any plants smothered out. I have heard people claim they had their plants smother, but in all cases that came under my observation the plants were injured either by winter or by some cause other than smothering. It is true that if the covering is left on late until the plants have started to grow that they would be injured, but with the everbearing strawberry the covering should be removed early, and by removing early they blossom early, and if the blossoms should be killed by a late frost it would be an advantage, for by the second time they come into bloom the plants would be better established to mature a crop of berries.

With the heavy mulching of hay and the additional covering with manure I conserved the moisture and had a continuous crop of berries from July 1 until October 14, on which last named date I picked 3½ crates of berries. My total receipts were 221 crates from three-quarters of an acre, which brought me $3 per crate, or $663.

There are several varieties of the everbearing strawberries on the market, but I consider the following the leading varieties: the Progressive, the Superb and the Americus. My first experience with the No. 1017, which was originated at our experimental State Fruit-Breeding Farm, was not very satisfactory, but know-

ing they had made such a fine showing there I planted it again this year on a heavy rich soil thoroughly manured, and they bore a good crop of fine large berries. I think it very essential that all everbearing strawberries have the rows thinned down to about six inches wide, with plants six inches apart, which gives larger and finer berries, and the plants are better able to stand the dry weather than they would be if left in a matted row.

The United States government sent out an expert to investigate the everbearing strawberry throughout the United States. He stopped at my place last spring. He went through Iowa and Missouri and worked west to the Pacific Coast, spent the summer in his investigations and came back over the same route and was at my place again this fall. His verdict was that where people had planted the everbearing strawberry on suitable ground and taken the right care of them they had proved a great success. When they are as extensively grown as the June bearing varieties we cannot expect the fancy prices that we are now getting.

A Member: I would like to ask Mr. Brackett if he cut out the old plants this spring and got a spring crop off of his berries from the new plants?

Mr. Brackett: It is a very good plan to take out the old plants for this reason: Everbearing strawberries bear up to the time the ground freezes up, and I think I had at least twenty-five bushels of green berries on my plants this fall that were frozen up. This heavy crop has weakened them to some extent while the runners have not been weakened so bad. You want to uncover your strawberries early; let them get started, and then if the frost comes along and kills the blossoms it don't hurt them at all, they will go ahead and new roots will get started and there will be another set of blossom stems. It doesn't hurt them to get frosted that way, while with your common berries if they get uncovered too early and get killed that is the end of your crop.

A Member: I would like to ask how to treat the everbearing strawberry for plants, if you want to get plants from it.

Mr. Brackett: I will tell you how I do it. I plant my everbearing plants early in the spring. They will start out runners, and we let them do that. Those runners nearly all of them will bear, and in the spring—or next spring, as I told you—I take up all those runners except just to leave that little narrow row, only six inches wide and plants six inches apart. You can keep an everbearing strawberry bed year after year if you take care of it, and you can grow June-bearing berries if you take care of them, but show me the man that will do it. Not one in five. They will let the weeds grow up, intending perhaps to do the weeding at some

future time, but it is neglected and finally the weeds will ruin the patch. It is easier to plow those under and plant a new bed than it is to take care of the old ones.

Mr. Rasmussen: I would like to ask the speaker if for a period of years he has irrigated half a field of strawberries and let the other half go.

Mr. Brackett: I irrigated the whole bed, and it all went. All the irrigation in the world wouldn't have helped them; they were root-killed in the winter.

Mr. Rasmussen: If you had irrigated half and let the other half go you could have compared them. How do you know what the result would have been?

Mr. Brackett: Because I watched Mr. Endsley, of Lake Minnetonka, who put up a $2,000 plant, pumping from Lake Minnetonka, and only used it two years, and if he hadn't had plenty of water he wouldn't have used it that long.

A Member: What kind of everbearing strawberries are there?

Mr. Brackett: There are probably fifty or a hundred varieties of the everbearing strawberry. The Americus, the Progressive and the Superb are the three leading varieties. The Progressive is probably the most popular, you will hear it recommended very highly, but the Americus has done the best for me. Now, whether that is on account of my soil or what it is, I don't know.

A Member: You have the clay soil?

Mr. Brackett: Yes, sir.

A Member: Isn't there a difference in getting results on sandy soil by irrigating than to irrigate on heavy soil ?

Mr. Brackett: Yes, sir, there is a difference. On sandy soil you are much more liable to get root-killing. Now you will find a great many strawberry patches killed out next spring by root-killing because they have gone into winter quarters dry. The ground is dry, and you will have injury to them, and you no doubt will have injury to the raspberries and apple trees if they are dry and no mulch around them, by root-killing.

Mr. Rasmussen: Wouldn't it have been a good idea to irrigate them so they would not have gone into winter quarters dry?

Mr. Brackett: Now, Mr. Underwood has an orchard down there of several hundred acres. I want to ask him if he irrigated this fall so they do not go into the winter dry.

Mr. Underwood: I can't irrigate, they grow on a side hill where I couldn't possibly irrigate, but Mr. Brackett knows I lay great stress on having moisture in the ground. I irrigate them in this way. Every tree has a little channel cut around it up above it, and the water that falls runs into the basin where the tree sets, and they get their irrigation in that way. This moisture that is needed, if you can't get it from the side hill in the way I do, you get irrigation anyway. Don't let them go into the winter dry.

Mr. Brackett: How did your ditch work this fall when we didn't have any rains?

Mr. Underwood: We had rains. And another thing I wish you would tell me, how would we have got any strawberry plants to sell this next year if we hadn't irrigated our strawberries all through that dry season? They just stopped growing and we irrigated them and they went on growing, and we have got some plants, and I am sure we wouldn't have had any if we hadn't irrigated.

Mr. Brackett: We have had as dry a year as we have known, and on my everbearing strawberries I will guarantee I have a hundred thousand runners I can take up.

Mr. Latham: What kind of a location does that strawberry bed stand in?

Mr. Brackett: It is in a very favorable location. As I told you, it is on timber land, on land that had grown big hard maples and basswood. There was a great deal of leaf mold there and I fertilized it very heavily. It lays low with the hills above it, and I think probably it is one of the very best. If it hadn't been I wouldn't have bought it.

Mr. Latham: Takes the water from the hillside?

Mr. Brackett: It takes the water from the hillside.

Mr. Latham: It is irrigated naturally.

Mr. Brackett: That is the kind of soil you want to plant your strawberry bed on, irrigated naturally and not artificially.

Mr. Rasmussen: Mine is a low, clay soil, and I put on lots of manure. The gentleman spoke about irrigating apple trees. We happen to have a few Wealthy trees in the raspberry patch that are absolutely the same as the ones outside of the raspberry patch. We watered them, and the fruit was one-third larger and hung on during the season while the others fell off.

Mr. Smith (Oregon): If you have ground that does not contain natural moisture to produce vigorous plants and does not hold moisture during the season, why it would certainly pay to give them a drink when they are thirsty. The kind of land has just as much to do with it as the method of cultivation. The gentleman here from Wisconsin, Mr. Rasmussen, described his method of growing strawberries. Just across from the famous Hood River strawberry growing district, which probably grows a larger amount of strawberries than any other section, just across on the sandbar, the sandy land on the bank of the Columbia river, a man for the last fifteen years has been practicing the same method as that of Mr. Rasmussen in growing strawberries, and seven years during that time he has won the highest price for the first perfect crate of strawberries. I have to talk irrigation frequently, but understand this: I always say when you can reach moist dirt with your finger you don't need to irrigate. But when your plants need irrigation give them a drink. Mr. Brackett happens to have some place where the land does not need irrigation, but where it does need it you will find it a decided advan-

tage. In other words, it is an advantage to have water to give your plants when they need it if the Lord don't furnish it.

Mr. Brackett: He ought to have added, if you can afford to.

Mr. Hawkins: I want to say I visited Mr. Brackett's strawberry patch. He called me up over the telephone and he said the Americus was doing better than the Progressive, and I wanted to see that with my own eyes before I would believe it. I went there and when I came there, it was some time in September, and the patch was literally red with berries. I looked up to see why his patch was doing so well, and there was six inches of manure between the rows, and, more than this, you could make a mud ball in September. So I think he has plenty of irrigation.

Mr. Gust Johnson: I would like to ask how long the everbearing strawberry will bear without water on your land. Have you ever tried that?

Mr. Brackett: It bears until it freezes up in the fall before it quits.

Mr. Kellogg: If the strawberry bed went into winter dry, would you water it in the winter or would you depend on mulch?

Mr. Brackett: I have protected mine by mulch. It would be too big a job to water it unless you have the water so you can control it perfectly.

Fruit Improvement Through Bud Selection.—The work of keeping performance records of select trees of the Washington Navel and Valencia oranges, Eureka, Lisbon and Villa Franca lemons, Marsh grapefruit and Dancy tangerine has been continued during the year. Deciduous-fruit performance records on select trees of Carman, Elberta, Hale and Belle peaches and Baldwin, Ben Davis and Northern Spy apples have also been kept. In addition to these records, a tree census has been obtained, showing the conditions of established commercial orchards in regard to the uniformity of type of trees and fruits borne by such trees. More than 200,000 select fruit-bearing buds from citrus trees with known performance records have been placed in the hands of cooperators who are to permit the department to secure progeny records from the trees so propagated. These buds are not only for the propagation of nursery stock, but in many cases for the top-working of unprofitable trees in established plantations. Recently, in co-operation with the California Fruit Growers' Exchange, a systematic campaign has been undertaken to eliminate all of the inferior strains of grapefruit in California by top-working trees of such strains with select buds from trees of the Marsh variety with known performance records, thus reducing the grapefruit production of the State practically to the basis of a single variety. Each year sees an increase in the number of citrus growers in California who adopt the commercial tree performance record system for locating trees of unprofitable character, either because they bear little fruit or because they bear fruit of a strain not well suited to commercial use. A second commercial nursery has been established during the year in California for the purpose of propagating trees from wood borne by record individuals.—U. S. Dept. Agri.

Evergreens.

REV. C. S. HARRISON, RETIRED NURSERYMAN, YORK, NEB.

Plenty of evergreens judiciously planted will check the fury of Old Boreas as he sweeps down from the north and give you a cozy shelter from his wrath. They bring the greenness of summer into the heart of winter. Animals greatly appreciate their protection, and when the sun shines on cold winter days you will see them sunning themselves on the south side of the evergreen hedge.

In our bleak northwest, where cattle are fatted in the open, often the protection they get is simply a wire fence—a poor shelter when the blizzard rages. A very expensive fence, too, it proves, for the loss of flesh on a hundred steers in a long, cold spell would build sheds enough to protect them. We can at least have *evergreen barns.*

Lumber is high and will be higher, and attention is now given to a more comfortable shelter than all out of doors.

Take young bull pines grown from Black Hills seed, four years old and twice transplanted, and make a double hedge—rows ten feet apart and ten feet apart in the row, breaking joints. Have your hay and straw stacks in the center. Give your young trees the best of care. Build a fence inside to protect the trees from the stock till they get sufficient size, and give them the best of cultivation. Don't depend on the weeds to care for them. When well established they grow from twelve to eighteen inches a year, and sometimes they make two feet. So it won't take long for a fine shelter.

If you want to move your farm 200 miles south, then plant a lot of evergreens and stay right where you are. When it is thirty below, put your themometer in the open and down it goes. Now take it into the evergreen grove, and up it goes five degrees.

Plant for winter effect. Have a foliage garden to look at in the cold weather. Evergreens vary much in their tints and colorings. The scopularum, or silver cedar, is cone-like in form, much like the Irish juniper, as it shimmers and sparkles in its silver frostings. The Douglas spruce has a dozen different shades and forms.

The concolor is the most beautiful of all evergreens, retaining its form and color down to old age. The Scotch pine is light green. The ponderosa has a deeper color. The picea pungens stands guard in your yard like a faithful sentinel in

royal robes of silver and sapphire. So on a clear winter day you look out on your grove, and you have one of the finest foliage displays that winter can give you.

Raise your own evergreens. There is no bugaboo about it.

Colorado Silver Blue Spruce.

Get a little book issued by the Webb Publishing Co. and it will tell you all about it. I have sent a good many pounds of bull pine seed to the sand hills of Nebraska, and they had fine success raising them in the open. I sent a lot to a man in Morris, Manitoba, and he has one of the finest evergreen groves in the province, and he was simply a wheat farmer. For myself, I had a bed, without a screen, in a slightly sheltered garden, where for five years I

raised a fine crop of bull pine seedlings, transplanting every spring and reseeding the same bed, and I never failed of a good stand.

Some years ago I conceived the idea of raising evergreens in central Minnesota and so we started a nursery at Paynesville. We cleared out the brush and planted in the leaf mould. Having shelter on the south side, when directions were followed we had splendid success. Bull pine, concolor, pungens and Douglas spruce, all came up through that congenial leaf mould and did splendidly. Then a larger area was cleared and about $300 worth of seed planted. But some way they were not weeded in time. Twenty dollars spent in weeding at the right time would have saved $1,000 worth of seedlings. The seed came up all right and the weeds came also. Twice I went up in June and found the weeds two feet tall and thick as they could stand. I pulled them up and, of course, pulled up about five little evergreens to every weed.

Engleman spruce.

Now an evergreen, large or small, makes its push in early June. If well cared for it comes up good and stocky. If weeds are allowed to grow they become weak-kneed and fall over, and it is hard to ever get them up again. For a persistent lack of timely weeding I threw up the job, but first I demonstrated a fact which should be a valuable asset to all this northwest, that with a very little care

and timely attention a man can raise all the evergreens he can use for about two cents apiece.

So brush up, clear out a patch of hazel brush if you have it and raise your own. Plant in some sheltered spot—in your latitude it might be best to use a screen, but anyway raise your own.

I once took off my hat and made a bow to myself, twenty-five years ago. At Franklin, Nebraska, I had an experiment station. This town is near the 100th meridian and on the verge of the semi-arid regions, and during half the seasons you can leave the "semi" out and call it arid. Then sometimes the sirocco rages. At one time the wind was blowing like a blast from the furnace—mercury 112. I had white pine, white spruce, Black Hills spruce and Scotch pine in the nursery, also a lot of bull pine, and every tree went down but the bull pine. That seemed to laugh at the performance and appeared to say "give me some more."

Bull pine, 2 years old, twice transplanted.

I planted perhaps an eighth of an acre in straight rows, six feet apart. Twenty-five years after I visited them and was surprised at the result. The trees were about four to six inches through, straight as arrows and twenty feet tall. There was a canopy of green above, for the branches had met. The ground was covered with a carpet of needles. It was then I paid my respects to myself. I wished I had planted forty acres, and I would have had a mecca which would have been a resort in summer when the green canopy would have been a shelter from the sun, and the breezes would fan the visitors as they reclined in the shade on that soft carpet.

Some hints. Raise your own evergreens. Take care of them. Transplant when two years old in a nursery near your house. Cultivate well. Let them grow two years, then transplant again and let them stand two years. Then you have a fine lot of matted roots.

Take the time when it is cool and the ground is moist.

Black Hills spruce.

Your main dependence should be the bull, or ponderosa, pine. Always get seed from the Black Hills, for we have found seed from the foot hills of Colorado won't do. Prof. Green found that out to his sorrow.

Don't plant Norway spruce, black spruce or Eastern white spruce or white pine on your Western prairie.

The pinus aristata and pinus flexilis will do well. So will the mountain pine if you want a dwarf for your yard. Engleman spruce will do well if you can put it where it can be protected from the two o'clock sun. The pinus contorta, or lodge pole pine, which is the main tree growing in the Yellowstone National Park, ought to be tested. It is very hardy, growing where there are frequent frosts all summer, and it can pack the most trees on an acre of any tree you ever saw.

But put your main dependence on the bull pine. I know them, have raised them by the hundred thousand. Amateurs have raised in several instances 5,000 from a pound of seed and the seed costs $2.00 per pound. They are the identical tree the good Lord invented for all our bleak Northwest.

The most beautiful tree that grows is the concolor, or silver

fir of the Rockies. The picea pungens grows ragged at thirty years of age and is thrown on the brush pile.

The concolor, like the Christian, grows more beautiful with age. I have seen them seventy-five feet tall and four feet through, glistening in robes of emerald and silver.

The trouble has been with sowing seed from the lower altitudes of Colorado. The pungens grows at an altitude of 10,000 or 11,000 feet and often the concolor grows beside them. Now if you could find an honest seed collector who would secure seed for you from those higher altitudes you could raise something to depend on. Then growing at this high altitude is the beautiful sub alpina, which ought to grow well in the north.

Radish Growing.

CHAS. HOFFMAN, MARKET GARDENER, WHITE BEAR.

Radishes are grown more or less all through the year. In winter greenhouses produce them, and later towards spring they are raised in hotbeds and cold frames until still later they are raised in the open.

To produce good, crisp radishes three things are essential, abundant moisture, rich, mellow soil and good seed. These three conditions being present, it only lacks one other feature to insure success, and that is, right seeding.

In the small turnip-shaped varieties about twelve to eighteen seeds to the foot of row should give good results, provided the seed shows high germination. If it does not, it should be sown somewhat thicker. The summer varieties, like White Strasburg, should be sown thinner, as they form a larger plant, six to twelve inches to the foot, insuring a good result. Winter radishes, like the various Black Spanish sorts, should not have more than six to the foot to have well developed roots. Sow seed from one-fourth to one-half, or even three-fourths inches deep later in summer. Of all radishes only the small turnip-shaped is the commercial article, all other kinds having only local and limited sale. Of the turnip-shaped, both the red and the white tipped are about in equal demand. We usually cultivate them but once, and that as they are forming their second or third leaves. When they reach about three-fourths in size we pull them, tie them in bunches of from six to twelve, wash clean with a soft brush and market next morning. It pays to have them as attractive as one can have them, and to that end one should make a sowing about every week, as the third or fourth pulling does not compare with the first or second, neither in looks nor in quality.

Secretary's Annual Report, 1916, Minnesota State Horticultural Society.

A. W. LATHAM, SECY.

The society year, just closing, while it has not been from an economic standpoint as successful for the average horticulturist as could be desired has nevertheless been a most successful one for the society, the membership having touched high water mark, and in many other ways the society has demonstrated its value to the horticultural interests of the state.

This being the semi-centennial anniversary meeting of the society emphasizes especially the growth of membership during the fifty years of its life, beginning with a membership of ten in 1866, with 264 in 1891, at the age of twenty-five years, the first year of my service as secretary, and 3,837 at the present time, indicating well the increasing growth and usefulness of the society. The close of this year finds 3,454 names on the annual membership roll and 383 names on the life membership roll, making a total membership of 3,837 for the current year, an increase of 425 memberships at this date over the preceding year. There has been a material increase in the life membership roll of 383, consisting of thirty-two names, four of these honorary members, viz.: Chas. Haralson, S. H. Drum, F. W. Kimball, J. R. Cummins, and as far as we know no decrease, as no deaths that have come to the attention of the secretary have occurred in the ranks of this large life membership roll during the year. Of this membership a considerable proportion is to be credited to the auxiliary societies, of which there are now seven connected with the society, the total number of such memberships amounting to 957. Several of these societies are very active and doing most excellent practical work in their special fields. It would be well to encourage the organization of such auxiliaries at any points where there are two or three members who are willing to sacrifice something to organize and maintain such a local society. Occasional local meetings throughout the year, a plan pursued by some of these auxiliaries, adds greatly to their neighborhood usefulness.

The Farmers' Institutes have not contributed this year as much as usual to this membership roll. The changed conditions under which these institutes are held have diminished the opportunities for extending to the farmers of the state the opportunity to avail themselves of the advantages of this society, which, we

believe, is to be much regretted. Twenty memberships have come into our roll this year from this source.

The nurserymen have contributed also somewhat, although not so largely as in many previous years, the total number of names from this source amounting to 134. These are memberships that have been given by the nurserymen to purchasers of their nursery stock.

A special interest this year is connected with the distribution of plant premiums, and an unusual number of our membership have asked for them. There was offered a selection of eight varieties of assorted premiums which were made up and handled by Prof. Cady from the University Farm Station. Prof. Cady also had charge of the mailing of small lots of strawberry and raspberry plants which came to him in bulk from the fruit-breeding farm. The larger portion of the plant premiums were new fruits from the fruit-breeding farm, consisting of hybrid plums, No. 3 June-bearing strawberry, No. 1017 everbearing strawberry, and No. 4 raspberry. Eight hundred and twenty members called for the hybrid plums, 857 called for the No. 4 raspberries, 687 for the No. 3 June-bearing strawberries and 1,478 members called for No. 1017 everbearing strawberries.

The exhibits at the annual meeting last year considering the character of the season were very satisfactory, the premiums on fruits, vegetables and flowers altogether amounting to $604.00.

The display at the summer meeting was almost entirely of flowers, strawberries receiving only a very small amount. This exhibit surpassed any that the society had ever made, we believe, the total amount awarded at that time being $178.75, towards which the Minnesota Garden Flower Society contributed $65.00.

The trial stations of the society have increased in number by the addition of two stations, one at New Auburn, under the management of R. S. Hall, and another at Deerwood under the management of L. P. Hall, and one has been discontinued, at Madison, under the management of M. Soholt, it occupying practically the same territory as the older station at Montevideo. These stations are all well equipped, especially with new fruit from the fruit-breeding farm, and many of Prof. Hansen's new fruits are also being tried there. Their reports should be studied carefully by our membership as they appear in the monthly, and much valuable information may be received in this way.

The Orchard Prize Contest, inaugurated in the spring of 1914, is proceeding. There are twenty-three persons entered in

this contest and that number of orchards were planted. We have not heard from all of them this season. Twelve have so far reported, and undoubtedly we shall hear from the others. As far as known the orchards are generally in good condition.

It will be necessary on account of the increase of the cost of printing paper to ask for a somewhat larger appropriation from the state legislature for printing purposes at the coming session. The appropriation for the uses of the society has been for some years $3,000 per annum, and the printing appropriation $3,500. An increase of $500 for the printing appropriation is absolutely necessary to take care of our large issue of magazines and reports under the increased prices prevailing.

The library has had quite a good many accessions this year, in all 149 volumes, this bringing the number of volumes in the library as registered up to 3,449. The titles of the books which have been added to the library in 1916 will be found on page 509 of the report of the society for that year. The most important addition has been a set of twelve volumes of Luther Burbank's "Methods and Discoveries," an elegant affair which we were fortunate in securing for thirty per cent. of the regular price. We have found it necessary to purchase several new book cases to accommodate this large increase in our library.

The society has never been stronger in its working membership, nor had a more hopeful outlook than at present, and we anticipate an increased interest in its work and a continually enlarged membership. The finances of the society are in excellent condition as indicated by the secretary's financial report and the treasurer's report to be published later.

ONE day last summer I saw a man in town with two bushels of the largest and finest-looking currants I ever saw. He sold them at eight cents a quart as fast as he could measure them out. Everybody declared they were a new variety, and he could have taken several orders for cuttings. When he was done I told him that I knew they were the old Cherry currant, and asked him how he grew them so large and fine. He said he had them planted along the east side of a six-board fence, so that they were shaded from the afternoon sun. Then he manured the bushes heavily with coarse barn-yard manure applied in the fall. That's all there was to it. Ordinary Cherry currants went begging at five cents a quart, and his were snapped up at eight cents as fast as he could handle them.

Compulsory Spraying for Fruit Insects and Diseases.

K. A. KIRKPATRICK, HENNEPIN COUNTY AGENT, WAYZATA.

Wide experience and observation in teaching, and extension work in a number of states, have led the writer to believe that neglected orchards or fruit plantations are a real menace to any community that is attempting commercial fruit growing. The same might also be said regarding poorly handled truck crops in a section devoted to truck growing. Inasmuch as every community has organized means for dealing with human and animal diseases or with any other problems that are of grave public concern, it would seem that all communities engaged in specialized farming, such as commercial berry growing, orcharding or truck growing, must very soon put in effect measures to maintain compulsory spraying and approved care of all plantations in those neighborhoods in order that the highest community efficiency may exist. Only when the community is reaping 100 per cent. results from its efforts can individual property be at its best therein.

Undoubtedly the point will be raised that any compulsory procedure would be radical and smack of paternalism in public affairs. There are a few people in our midst who want to wallow in and swallow a brew of "spread eagle" independence. Today our only hope in the industrial or the farming world is *inter-dependence.* Where hundreds of people are gaining their living out of a specialized crop it is certain that the majority of the better class of growers will not long tolerate the shiftless, careless individual who is a real danger and a profit-loser to them. The time is coming when such inefficiency, either from choice or necessity, will be barred out of the community, call it paternalism or any other name that we may wish. It is certain that the progressive growers in any such communities will quickly welcome any plan for controlling neglect in their midst if such plan can be shown to be practicable.

Can we show practicability in any suggestion for compulsory measures in the State of Minnesota? It will not suffice to advocate the system followed in western states, where there are horticultural associations with strong county organizations through which a horticultural inspector works. These men get nominal to splendid results, depending upon their own ability and the type of people with whom they have to work. If any compulsory measures are to be adopted in Minnesota it is

believed that too much local responsibility for carrying them out may not be given, while on the other hand, any great showing of authority from outside the community will not be brooked.

If any measure of a compulsory nature in protection of fruit or truck crops are to be entertained by all parties concerned in the state, it is believed that the initiative for them should come from local parties. Progressive men in communities devoted to these specialized industries must self-act to the extent of sounding out sentiment, laying out the proposed boundaries for areas to come under such measures and in making preliminary arrangements for getting any plans into execution. The enforcement of measures after they have been initiated and approved by any locality should be left wholly with state or outside forces.

It is evident that any compulsory spraying or crop pest control measures along the lines laid down above must be of local application in our state. The following outline has suggested itself to the writer after conference with many growers and with several departments at University Farm. Much thought has been expended on this plan, but we trust that this meeting will pick the project to pieces and reassemble it as may seem best to them. In fact it is only hoped that this presentation may lead up to agitation that in the course of a few years will get the results suggested in the heading to this paper.

First: It is believed that any measure of a compulsory nature should not apply unless at least 15 per cent. of the tillable area in any certain district may be shown to be cropped with tree or bush fruits or some other specialized crop warranting such action.

Second: 25 per cent. of the acreage in such specialized crop or crops should be represented in a petition for a hearing signed by the owners of this acreage.

Third: Such petition should describe and define the area in which it is proposed to have a compulsory spraying measure, and after the signatures of the owners indicated above have been appended it should be filed with the Director of the State Agricultural Experiment Station along with a request for a preliminary survey for the district in question and a public hearing in the matter within two months from the date of the petition.

Fourth: After the above procedure has been complied with the director of the Agricultural Experiment Station shall direct the state nursery inspector to conduct a public hearing on a

properly advertised date at a centrally accessible point in the proposed compulsory spraying district. At this hearing all local parties should be privileged to appear to uphold or oppose action on the measure.

Fifth: At this hearing the president of the County Farm Bureau or similar county farmers organization, one county commissioner, one representative from each of the Horticultural, Plant Pathology, Economic Entomology and Agricultural Extension Divisions of the State University Agricultural Experiment Station should be present.

Sixth: After supporting and opposing arguments have been heard, a vote of local parties present, each of whom should be an owner or operator of a plantation in the district in question, should be taken on the action. If 60 per cent. or more favorable votes should be cast, such voting would authorize the declaration and publication of the territory covered by the petition as State Compulsory Spraying District No. ——.

Seventh: When this action shall have been accomplished, the director of the State Agricultural Experiment Station shall authorize the state nursery inspector to declare and publish the action describing the district and defining its boundaries.

Eighth: The next step might well be the election of five local directors each of whom should be a property holder and resident within the district in question to constitute a local board of administrators to administer the control measures in the district. This board, in conference with the state nursery inspector and the director of the State Agricultural Experiment Station, shall estimate the cost of the biennial control inspection of the district. In recommendation from the local board of control directors, one-fourth of the amount necessary for each ensuing year shall be included by the county board of tax levy on the tax levies against property included in the compulsory spraying district as outlined in the published declaration noted above. Three-fourths of the estimated amount for each year's control inspection shall be appropriated from state funds and be included in the state nursery inspection budget of expenses.

Ninth: The state nursery inspector and his deputies shall have charge of the enforcement of the compulsory spraying measures. They shall have police power and may order plantations handled along approved methods endorsed by the State Agricultural Experiment Station, such action to be taken by the owner within a prescribed period, or if an owner or operator

refuses to take such action may order the destruction of the crop or plantation by plowing or grubbing and burning. In case the owner or operator refuses to take such action, the inspector with his deputies may hire the work done and the actual cost of such destruction shall be paid out of the county contingent fund and shall constitute a lien against the property on which the crop or plantation was growing, and if not paid before shall be collected with any penalties at the time of the first transfer of such property after the destruction was ordered and carried out.

Beautifying the Home Grounds.

J. M. LINDSAY, AUSTIN.

This sounds good, looks good, and when put into practice would be a great deal better. A man will build a three to five thousand dollar house with all the latest improvements and perhaps have only $.50 to $1.00 worth of some shrubs or flower. A well-arranged lawn should include a nice hedge, some shrubs, roses, bulbs and vines, with a few ornamental trees to complete the beauty of the home. A three to five thousand dollar house without these flowers reminds the sight-seers of a man that put up a lot of posts, thinking they would keep the stock in without the wires.

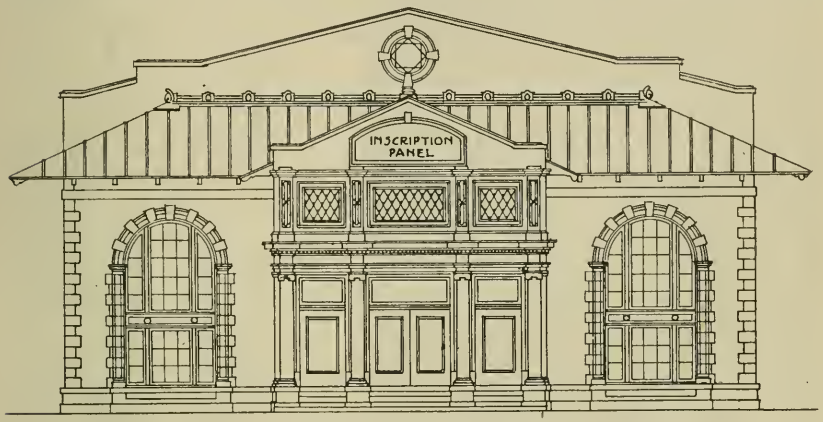
Minnesota would be second to California as far as having beautiful lawns is concerned if the practice was more general. People visiting California are delighted with the beautiful lawns. This subject is one of the principal ones talked of on returning from California. We can have the lawns look just as beautiful here in Minnesota if we would plant out in abundance as you see in California and with less expense. There are so many hardy shrubs, bulbs, roses and vines that could be planted in a lawn that take very little care. There is a great amount of labor each year preparing annual beds. They are all right, but there is less labor with the perennial beds.

Plant a purple leaf barberry hedge and complete the lawn with hardy shrubs, such as spireas, snowballs, flowery almonds, iris, hydrangeas, phlox, high bush cranberry, clematis and flowery vines. Do this if you would have one of the prettiest lawns in Minnesota.

Uses for the Proposed Horticultural Building.

A. W. LATHAM, SECY.

In the January, 1917, issue of our monthly there appeared on page 6 an article speaking in regard to the needs of the society for a home, accompanied by plans and descriptions of the proposed building. The members of the society are fully assured of their needs for such a building, as never in all the fifty years of its life has it had a really suitable place for its annual gatherings, one which provides a suitable hall for the meeting of the society and an exhibition hall large enough and well enough



FRONT ELEVATION
Scale 8 Feet

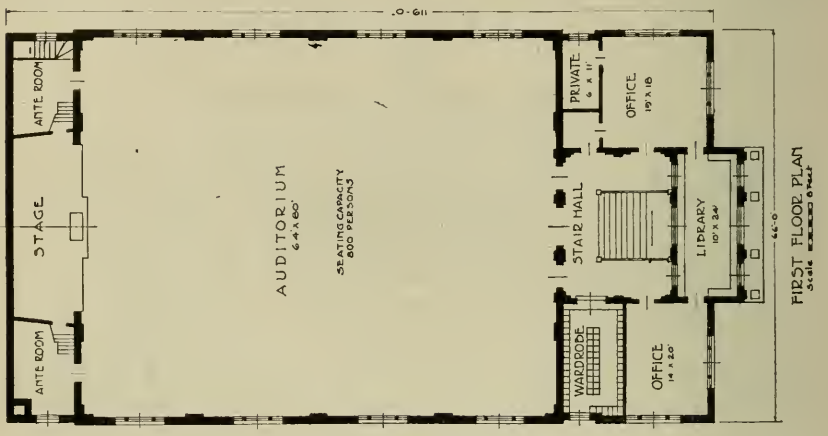
PROPOSED HORTICULTURAL HALL
FOR THE
MINNESOTA STATE HORTICULTURAL SOCIETY

arranged so that the exhibition in all of its classes may be installed in a way to impress those who might see it.

The proposed building, to be located at University Farm, would provide all of these facilities and many more. It would not only be an ideal place for the annual meeting of the society with its large exhibits of all classes of horticultural products and an equally valuable one for its summer gathering with its immense showing of outdoor flowers, but it would provide equally good accommodations for all of its auxiliary societies in connection with their meetings, many of which are held with much greater frequency than those of the state society. The Garden Flower Society holds a number of meetings during the year, alternating between Minneapolis and St. Paul, and with this central location all of these meetings could be held in the horticul-

tural building. The Bee-Keepers hold one or more meetings annually. The Forestry Association one or more, the State Florists Society hold frequent meetings and a number of exhibitions during the year. This midway location would accommodate the florists to a nicety. The Vegetable Growers have lately organized a State Vegetable Society, which would find this building and its exhibition halls a convenient place for their purposes.

Besides the Horticultural Society and its auxiliaries there are also a large number of other state societies devoted to various branches of agriculture and stock breeding, a dozen or more of



Ground floor plan of proposed Horticultural Building.

them, all of which would find a welcome place for gathering in this proposed building. The Farmers Home Week at University Farm, where the building is to be located, would also occupy the halls the building provides, and a variety of other uses would be found for it in connection with the varied interests developing and fostered at University Farm. In fact such a building as this is greatly needed. Nothing of the kind can be found in either of the Twin Cities, and located centrally as this would be, at University Farm, there would undoubtedly be calls for it that would provide rental for other uses than those noted above. Where hundreds of conventions from all over the country meet in the Twin Cities some at least would be especially well accommodated by such a building in the midway district.

This matter is now pending before the state legislature, and the attention of our membership is called to it that they may assist in every possible way to secure the enactment of the necessary legislation to provide for the construction of the building.

Handling and Storing Gladiolus Bulbs.

G. D. BLACK, ALBERT LEA, MINN.

Gladiolus bulbs are not dead or inanimate things like clods or stones. They are alive and will give us more and better flowers in return for good treatment, just as surely as do our domestic animals give us more and better eggs and milk when we give them the proper attention.

Taking care of the bulbs during their dormant state, from the time they are harvested until they are planted again, has not been given the attention that it deserves. It is not reasonable to expect best results from a bulb that has lost part of its vitality during this time.

Golden King gladiolus, originated by G. D. Black.

What I shall say on this subject will be based on my personal experience.

We commence digging about the middle of September. We first harvest the small bulbs that have grown from bulblets. It is not necessary that these become ripe before they are dug.

We prefer that they do not grow too large, so that we may be able to plant them next spring with our planter. If they are larger than three-fourths of an inch they must be planted by hand.

These small bulbs are usually dug by loosening them with a spading fork, so they may be easily pulled up and broken from the tops into a sieve which will retain the bulbs and permit the soil to be shaken through. As we grow these small bulbs in such large quantities we do this work with a machine of our own construction.

We next harvest the early varieties of the large bulbs and leave the latest varieties until the last. These should also be loosened with the spading fork so that they may be lifted easily

from the soil. Large growers use a digger drawn by a horse, which runs under the bulbs without turning them over.

If the bulbs are just ripe enough, the tops can be easily broken off without injury to the bulbs, but if they are tough they should be cut off close to the bulb with a sharp knife.

The roots and old, shriveled bulbs can be pulled off easiest about a month later, before they become too dry. These should always be removed before the bulbs are planted again.

G. D. Black alongside his exhibit of gladioli, at Freeborn County fair.

A small quantity of bulbs may be stored in a market basket and placed on a shelf or hung from a joist in the cellar. If there are a number of different varieties that you wish to keep separate, they should be put in paper bags when dug. For storing large quantities we use crates eighteen by forty-eight inches in size. The bulbs should not be more than three or four inches deep in the crates or baskets, as they are liable to sprout or become mouldy if the air cannot circulate among and around them.

They should always be kept dry and cool. A furnace room is usually too dry and warm, a wet cellar is too moist. A cellar which keeps potatoes well is usually all right if the potatoes are kept on the floor and the bulbs overhead. A cool closet that does not freeze is better than a very warm or damp cellar.

They will keep in best condition in a temperature ranging from thirty-two to forty degrees, with just enough moisture in the air so that they will not shrink much. Too much moisture will cause them to sprout, which will weaken them as much as

when they become too dry. This is the reason that gladiolus bulbs imported from Holland are seldom satisfactory.

If the temperature and humidity of the air in the storage cellar can be properly controlled, I do not know any reason why gladiolus bulbs may not be kept in the cellar through the summer and used for forcing in the greenhouse. They could be planted in September and October, or at least two months before the new crop of bulbs are sufficiently cured to be available for this purpose. We have accidentally demonstrated this to our own satisfaction. In the autumn of 1915 we found two lots of about 100 each in the cellar on the crates that had been overlooked at planting time.

One of the varieties, the Marie Lemoine, had grown new bulbs on the old bulbs, while on the crate in a dry cellar, without forming roots or tops. The other variety, No. 121, did not form new bulbs, but were somewhat shrunken. We saved both lots and planted them last spring.

The new bulbs of Marie Lemoine which formed in the cellar the previous summer produced only a few spikes of bloom. The bulbs of No. 121, which had remained in the cellar for two winters and one summer, grew and bloomed just as well as bulbs of the same variety that were a year younger.

A few days ago I found a few bulbs of Mrs. Francis King in the bulb cellar at Albert Lea that had formed new bulbs, while in a perfectly dry state. I have these bulbs here as proof of my veracity, as I will admit that I should have been very slow to believe this story until I had the actual experience.

Some time in April, 1915, we sent a small package containing four bulbs to a customer in New York. About a month later he wrote that he had not yet received the bulbs, and we refilled his order. In April, 1916, just about a year after we had sent the first package, he received it and returned it to me, remarking that a history of its journey for a whole year might be interesting.

A neighbor of mine who is a railway mail clerk says that small packages and letters are sometimes left in the mail bags when being emptied, and it is a rule that when ten empty bags accumulate in a car they are made into a bundle and sent to Chicago or some other large terminal. It is supposed that this small package of bulbs was stored away in a bundle of mail bags for about a year before it was discovered and sent on to its destination. Upon examination we found that one of the bulbs in this package had grown a new bulb about an inch in diameter. We planted the new bulb that probably grew in a mail bag and it produced a small spike of bloom. I hesitated quite a while before writing about this incident because it is almost unbelievable to those who have not had much experience with the gladiolus.

Flowers for Everybody's Garden.

A. S. SWANSON, FLORIST, WAYZATA.

Make a garden like this and buy, say, 50 cents worth of good seeds to start with the first year, and the annuals I am going to recommend will all ripen seeds here; and if you save just a very few of the very best and most perfect flowers which first open for seed and harvest them when ripe, you will have as good, or perhaps better seeds than you can buy.

There is no reasonable excuse why everybody's garden should not have a wealth of beautiful flowers, just as good and charming a setting for a home as has any millionaire, because happily the best annuals are among the loveliest of flowers and will compare in every respect with the choicest of the more tender species which must be raised in greenhouses and given extra care and attention if they are to amount to much.

In the first place I would name Zinnea Elegans, the strong growing strain. This splendid tropical looking, robust growing plant with its rich, glossy green foliage grows to a height of three feet, crowned on every branch with flowers four inches or more across, and sometimes as much in height, in shades of all colors except blue. This splendid plant is eminently fitted for and worthy a place in everybody's garden, not only because of its charm, but perhaps even more because of its sturdiness, whereby it will take care of itself when once planted and will thrive under most any conditions, though it must not be deprived of the sunlight.

Next in order I would put the African Marigold (Tagetes), the Eldorado. It is a splendid, large-flowering, robust growing plant, will grow three feet or more in height and give a wealth of its golden and orange flowers through the summer until cut down by frost. Next in order I would put Phlox Drummondi Grandiflora. This charming plant is also of such robust habit and strength it will almost care for itself after being planted, and the wealth of flowers it will produce is really remarkable, and it will produce them all through the summer if not allowed to bear too much seed, in almost endless variety of colors, shadings and markings of the flowers, which is one of its greatest charms.

These three species of flowers should not be missing from anybody's garden. I do not care how large or imposing or how small or humble it is, they are just as much at home in one as the other. While they may be raised from seed sown outdoors

in the place they are expected to bloom, very much better results will be achieved by sowing the seed the 1st of April in what a gardener terms a cold frame. This is easily constructed with four boards, say about six feet long, about twelve inches wide, by simply nailing the ends together and making a square frame, though one side should be a little higher so as to give a slope to the cover or roof, enough to readily shed the rain if covered with glass, which is much the best; six inches will be sufficient, but if cloth or canvass is used for covering twelve inches is not too much.

Place this frame in a warm, sunny place—a southern slope is best—in such position that its highest side will be the north side, so the frame will slope towards the south. Put in about three inches of good, loose soil—a light soil that is not apt to bake or form a crust is much the best—have this firmed down and perfectly level. Sow your seed in little drills across the frame about four inches apart and sow thinly. If after the plants are up they are crowded, thin out to at least two inches between each plant or transplant. When sowing do not cover the seed more than one-half inch. I should perhaps have stated the soil must be fairly warm before seed is put in and not too wet. This may be easily accomplished by having it exposed to the sun a few days before. Of course it must be sheltered from frosts, cold winds and heavy rains and looked after with water when dry—but do not coddle them or nurse them too tenderly. Give them plenty of air and sun, and when the weather is anywhere near comfortable let them be exposed to the elements, so as to make them sturdy and strong. About the middle of May set them out in their permanent quarters, or where you want them to bloom. This should be done during cloudy or rainy weather, or otherwise towards evening. Give each plant a good drink of water pretty soon after planting if moved with a clump of soil adhering to the roots, which may easily be done by giving them a good watering a few hours before transplanting if at all dry.

The Zinnas and Marigolds should be planted fourteen to eighteen inches apart, depending on the soil, the better and richer the soil the more space should be given to each plant. The Phlox should be given about a square foot each. Now if this transplanting is done with some care, and the soil is in fair condition, the plants should not need any watering at all, the natural rain should be moisture enough. For their well being, keep the

surface of the soil stirred occasionally and keep it clean from weeds, and if the season is not a very wet one a light mulch of stable litter applied about the first of July will be all the care they require. You will be very much surprised at the results, the wealth of grand flowers you will have until frost cuts them down.

Besides these we have quite a variety of Dwarf Sunflowers, which I consider very charming and worthy of a place in anybody's garden. I like especially the single varieties. They have a very refined and artistic appearance. Growing to a height of about four feet, with numerous slender branches always supplied with a wealth of flowers, they are very desirable to place in the background or for filling up odd corners. They may be raised and given the same treatment as recommended for the Zinnias and Marigolds.

Very many of our prettiest and loveliest annuals may be sown right in the beds where they are to bloom, and they thrive and develop best when not disturbed by transplanting. In this class I should place Calleopsis at the head. This is a splendid, easily grown plant which thrives and flourishes under almost any condition. They come in a great variety of colors, from rich crimson garnet and velvety brown to golden yellow, and are very free flowering, being literally covered with charming flowers, of which single plants will produce thousands through the summer. When sowing do not sow too thick, and when up thin out to at least six inches between the plants. As an all around desirable and easy plant to grow, which will give most pleasure for the little cost and trouble in sowing them, I think I would place some of the Poppies next in order. The charming Shirley Poppies at least should not be missing in any garden. The main quality I like them for is their earliness; they will be in their glory before most annuals are ready to show color, and though they do not last all summer they richly pay for their place while they are with us. When through their beauty they may be removed and their place taken by their slower sisters, like Centaureas, which take more time for their toilet; or to develop their beauty they may be so sown as to fill the place of the Poppies by having the rows alternate.

There is quite a variety of Centaureas worthy of a place in anybody's garden. Centaurea Cyanus (Cornflower) comes in a great variety of colors from white to darkest blue. Centaurea

Imperialis (Royal Sweet Sultana), is another class of beautiful sweet scented artistic flowers in pink, rose, lavender, purple and white. Centaurea Suaveolens (Yellow Sweet Sultan, or Grecian Cornflower) is the only variety which produces yellow flowers, and they are very sweet too.

Another one of our bright, pleasing annuals of very easy culture is Caculia (Tassel Flower, or Flora's Paint-Brust) which produces its beautiful scarlet red, tassel-shaped flowers in great profusion all summer. Gaillardia (Blanket Flower) is another charming annual of easy requirements and should be given a place in every garden, producing, as it does, its large, brilliant and showy flowers from early till late with the minimum of care or attention.

Sweet Alyssum, Candytuft, Ageratum and Mignonette are plants easily grown, and are general favorites as much by reason of their fragrance as anything else. They are all rather low growing and should be given a place on the outside of the flower bed as a border. Nasturtium is another well known and generally appreciated flower which should, however, not be mixed with any other flowers but a separate place reserved for it. In a dry place, not too rich soil, they will bloom best. The seeds must not be sown until the soil is warm, say after the first of May.

All the other annuals mentioned should be sown early as soon as the soil is in condition to work, that is as soon as it is dry enough in the spring so as to make it mellow and not sticky. Do not touch your soil in the garden before it is in condition. Nothing is gained by it and very often much time lost, and your plants will never do well if planted when the soil is in a wet or sticky condition. Portulacca, called Sun Plant because it loves a sunny exposed position, may be sown on a sunny slope, where nothing else will grow, and will cover the ground with a carpet in many of the richest colors and be a source of delight to everybody.

I could mention many others which are worthy of a place in everybody's garden of just as easy culture, but what I had in mind when writing this was to try to induce some one who has not tried to raise flowers to make a trial by pointing out the way, and show how little is needed and how easy it is to have at least some of the really good things there are in the floral kingdom. Anyone who will make a start with some of these I have men-

tioned will not be satisfied without adding a few more to the collection year after year. And when you have learned how to raise some flowers, with success be not afraid to try others of the hardier, robust growing species, such as Hollyhocks. While these are not strictly annuals, most of the single varieties which are the best for this climate will if treated as recommended for Marigold bloom the first summer, though not until late. If they have time to ripen any seed they will propagate themselves, and you will have plenty of seedlings another year which will be sure to bloom; and there is no showier or brighter flower in the whole list than these stately plants with their large, glistening, satin flowers in all colors except blue.

Some varieties of Tobacco (Nicotiana), such as Sylvestris and Affinis, are well worthy of a place in any garden—plants must be raised in the cold frame however.

Of flowers that may be sown right in the bed for best results Eshscholtzia, the California Poppy, with its bright yellow flowers and distinct foliage, is well worthy of place. Of Lupines the annual varieties are very easy to raise and very pretty, and so are the annual Larkspurs (Delphinium).

Petunias, such as Haward's Star and Rosy Morn and other single varieties, are very beautiful and will make a bright spot under trees or other shady places, where sunloving plants do not thrive. Sow them in cold frame and transplant, the same treatment as for Asters will give best results, and they will thrive best in partly shaded situations.

I could be tempted to include many more in my list, but am afraid I have made this paper too long already. Before I leave off let me warn you when sowing flower seed in the garden not to cover them too deeply as a very slight covering will suffice for most of them, and remember, the smaller the seed the less cover. A good plan is to sow in very shallow drills and cover with a little loose sandy soil, just sprinkled over the finer seeds. The coarser seeds may be covered one-fourth to one-half inch. Many failures that have perhaps discouraged many who tried to raise flowers from seeds is because of too deep planting and soil being too heavy. The tiny seed sprouts were unable to pierce the crust and consequently failed to appear. Another admonition: do not be afraid to thin them out when they appear too thick, give them plenty of room to develop if you want best results.

While I advocate rather long narrow beds or borders as being the best place to raise flowers, do not understand that I

thereby want them to be straight lines or square cornered beds. No! Make them with curved lines and rounded corners and as crooked as you will, and the better and more natural they will look. And the same in placing your different plants. Don't have each variety in straight lines; for best effect plant rather in irregular patches, letting the different kinds run into each other without any preceptible boundaries. The effect will be more pleasing and results more satisfactory.

One plant which I really have overlooked that ought to be perhaps the first one planted in any garden is Sweet Peas. This is such a general favorite that of course it must be in everybody's garden. It is of such easy culture and so satisfactory in every way that no one should have any trouble raising them or having an abundance of flowers from them. The mistake most common is to sow them too thickly and in poor soil. They love a rich, deep soil, and for the best result the soil should be broken up eighteen inches deep and if of a poor, gravelly nature put several inches of stable—not horse—manure in the bottom. Plant the seeds as early as the conditions will allow (I have planted as early as the fifteenth of March one year) and plant four inches deep. Sow thinly or thin out to at least eight inches between each plant and let them well cover the ground before giving them any support, at which time a good mulch of old manure should be applied first. The best possible support is stout brush trimmings from plum trees, and have this about four feet high and strong enough so it will not break down. Treated this way you will soon have the brush all covered and a solid bed of charming flowers, and if in a good, open situation and all flowers picked off so they do not produce seeds they should be a joy all summer.

That's a point to be remembered about all annuals—do not let them set seeds, or they will soon stop producing flowers. And remember to have your soil in good condition before sowing or planting so the plants may have a chance to get down deep in the ground with their roots, so they will be able to withstand the hot, dry spells of weather we occasionally get. My idea is that annuals for best results should never have any artificial watering, and if the soil is right they will not need it, but a good plan is about the time they commence to bloom to apply a mulch of some kind. And I would also add to not plant your annuals in little raised mounds, as is often seen. This is the worst possible

place for most of our best annuals to thrive in a climate like ours, where the rainfall is no more than what is needed and should by all means be preserved. Have your beds level with the surrounding lawn or ground, so as not to deprive the beds of their natural share of the precipitation.

Mrs. Boyington: I was so happy to hear our friend note the real reason that takes the farm boy and girl away from home that I just have to say something about it . We have had teachers all over the country studying the question how to keep the boys and girls at the farm. I found out something the other day. When the farm mother is perfectly happy in her farm home and surrounded by beautiful things of life, she will keep her boys and girls there. It is the farm mother that sends her boys and girls to the city because she is not willing that they should live under the conditions that she has lived under, and I think Mr. Swanson has just put the blame where it belongs. (Applause.)

"The Blight Bacterium, *Bacillus amylovorus*, discovered many years ago by Dr. Burrill, is the cause of the blight of pear and quince and twig blight of apple. It lives over in the blight cankers, especially upon the larger branches or trunks of the blighted trees. In this respect there is evidence that the pear is a large source of survival infection; also the quince, and as has been proved, the blight cankers on apple. With the beginnings of growth conditions in spring, just before blossoming time, these living cankers exude the zoogloea of the bacterium, and these exudations may be carried by any agency visiting first the bloom and subsequently other new growth. For this reason the advice to cut out and burn the blighted parts and all possible sources of surviving infection is founded on the right sanitation principle, and must ultimately be one of the means of reducing our trouble from blight."—A. D. Selby, Bulletin Ohio St. Hort. Socy.

The Currant Worm.—Most everyone is familiar with the spotted currant worm about three-quarters of an inch long, that is sometimes capable of stripping a bush of its leaves in a few days. Many growers wait until they see the worms before they spray, and to their surprise find considerable damage done. Timely application of Arsenate of Lead (1 oz. of the paste form to a gallon of water) will prevent their depredations. The eggs of the first brood are laid when the currants are in blossom, so that the first spraying should be applied as soon as the blossoming period is over, especially on the lower leaves. This year the proper time to have sprayed would have been about May 20th. The eggs of the second brood were hatching June 21st, about the time the currants are full grown. If the worms of the second generation are abundant fresh hellebore should be used at the rate of 4 ounces in 2 gallons of water. Black currants do not seem to be attacked.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So. Minneapolis.

NOTICES.

The committee named to judge the pictures in The Minnesota Garden Flower Society photographic contest awarded

First prize, Class I, Rev. H. D. Pomije, Olivia, Minn.;

Second prize, Class I, Mrs. M. L. Countryman, St. Paul;

First prize, Class II, Mrs. M. L. Countryman, St. Paul;

Second prize, Class II, Mrs. M. L. Countryman, St. Paul;

First prize, Class III, Mrs. C. E. Braden, Excelsior.

No second prize awarded.

Judges—Mrs. I. E. Richardson, Mrs. N. S. Sawyer and Mr. G. C. Hawkins.

The premiums, all of which are plants, will be sent to the winners in the spring.

A special premium of a year's subscription to the Garden Magazine will be awarded the member who secures the greatest number of new members from the beginning of the year till the close of our June flower show. In case the winner in this contest is now taking the magazine, either the subscription will be extended another year or another magazine or a garden book will be substituted. One of the very best ways to interest your friends in this society is to bring them to our meetings, show them our magazine and call their attention to the plant and book premiums offered by the Horticultural Magazine in the 1917 numbers. This contest will be open to members of the Horticultural Society. Send all new names, with a choice of premiums, to our secretary, Mrs. M. L. Countryman, 213 South Avon Street, St. Paul, *remembering* that plant premiums cannot be selected after April 1st.

February 9th meeting of society at Public Library, Minneapolis, corner 10th and Hennepin, 2:30 p. m. All about starting the garden and ordering seeds. Very important meeting.

Owing to the scarcity of seeds because of the war, all seed orders should be sent in as early as possible, as the supply of certain kinds is limited. If you do not receive catalogues regularly, postals, asking for copies, should be sent to the different seed houses at once. Making out the seed order and planning the garden should all be finished before the end of the month.

Some of our members are contributing seeds of choice flowers for our annual seed distribution. This is most welcome this year, as on account of the war, seeds are going to be high, of limited quantity, and hard to get. If you have any to contribute, please send them to either Mrs. Countryman, 213 South Avon Street, St. Paul, or to your president.

In the January Garden Magazine, Mr. G. W. Kerr, in an article on selecting flower seeds, suggests this border of annuals, the seeds of which will cost about two dollars. Each packet would contain enough seeds for from five to ten people if they were planted and treated carefully. So several could club together and greatly reduce the expense of this 36x6 ft. border, or order the convenient small packages some of our seed houses put up. Following is Mr. Kerr's list:

Back rows in irregular clumps, in the order given—scabiosa, azure. Fairy; celosia, Magnificent; centaurea, Americana; nicotiana, affinis hybrids; zinnia, Mammoth; arctotis grandis; rubekia speciosa bicolor.

Middle row in irregular clumps or masses in order given from left to right—phlox, rosea alba maculata; gypsophila elegans; antirrhinum, Cottage Maid; hunnemania; calendula, Lemon Queen; centaurea imperialis; phlox carnea, gaillardia picta lorenziana.

Front row, arranged in masses, in order named—alyssum, Little Gem; mignonette, Goliath; petunia, white bedding; eschscholtzia, Golden West; ageratum, dwarf blue; thunbergia; dianthus chineusis; eschscholtzia, Fire Flame; portulaca, Parana.

There is so much interesting and practical in this January number it would pay each of our members to have this number.

If you have old seeds on hand they should be tested as soon as possible so as to know whether they are good before making out your order. The best way is to sow them in a shallow box of finely sifted soil, giving them the most favorable conditions possible; that is, keep moist and warm. Count the number of seeds sown, and the number that germinate, and then you will know just what percentage will grow, and how good your seed is. If you have no earth the test can be made by putting several thicknesses of blotting paper or cotton wadding on a plate; lay on your seeds, keep warm and moist (it must *not* be allowed to dry out). It is well to keep it covered with a glass. Results can be as carefully noted as with the earth test.

This is the month in which it is well to go over all the garden tools, making sure they are quite ready and fit for use. Shallow boxes—about two inches deep—should be ready for starting seeds in. It is very important that these have *good drainage.* It is a great convenience to have a supply of labels ready, also some of those convenient and very cheap paper pots in which to transplant the little seedlings before putting into the open garden.

Make your garden on paper. This will save much time when the actual out of door work begins.

Are you feeding the birds these cold days?

MINNESOTA GARDEN FLOWER SOCIETY PROGRAM, 1917.

February 9, 2:30 P. M.—Minneapolis Public Library. Fertilizing the garden, hotbeds, cold frames, transplanting and care of seedlings. Use of catalogues.

March 9, 2:30 P. M.—Wilder Building, St. Paul. Kinks in starting seeds, roses for Minnesota, their culture and care, garden arrangement (with slides).

April 13, 2:30 P. M.—Minneapolis Public Library. Distribution of trial seeds, with talks on special varieties; special purpose plants; plants for shade, poor soil, dry situations, bogs; cutting; fragrance; rock gardens; ground cover; "Honey," good white flowers.

May—St. Paul. Non-competitive flower show and plant exchange. Special topic, Iris.

June—Annual flower show with Horticultural Society at Farm School.

July—Minneapolis. Picnic at Wild Flower Garden, Glenwood Park. Personally conducted by curator.

August—Picnic at Como Park, St. Paul. Visit to garden. Talk by superintendent of garden.

September 14—St. Paul, 2:30 P. M., Wilder Building. Bulbs and their artistic planting. Succession of bloom in bulb garden. Fall planting.

October 12, 2:30 P. M.—Minneapolis Public Library. Fall covering. Heeling in. New varieties especially successful. Reports on seeds.

November—Chrysanthemum show, Como Park Greenhouses.

December—Annual meeting with Horticultural Society. Dates to be announced later.

SECRETARY'S CORNER

"The Plums, No. 20, received from the station two years bore about fifteen plums this year, and will say that I think them better for eating than the Opata and a really fine looking plum. Purple skin and a dark red meat, fine and sweet."—M. L. Gibbs, Echo, Minn.

If You Send Check in payment of annual fee in the society add to it a sufficient amount to cover the cost of collection, and take early opportunity to tell your banker what you think of this change in the time-honored method of doing business which involves so much expense and annoyance. You better send a dollar bill anyway. It will come through all right.

Give Them Water.—"Tell them to give all trees and shrubs enough of a drink in the fall after the leaves are down to last them all winter and keep on telling them until they believe it—and then we'll have less trees freeze dry over winter. This a good fruit country, because it rains in the fall. The middle state are too dry in the fall. You must irrigate."—C. J. Manner, Jerome, Idaho.

Plant Premiums All Postpaid.—An important feature of the distribution of plant premiums this year is the fact that they will all be sent out *prepaid by parcel post,* so that the recipients will not be put to any expense in connection with receiving them. Last year many of them went by express collect, but we found it a very expensive way of sending them, and have concluded this year that the society would bear the expense of distribution, so all the member pays is his annual fee to secure a share of these valuable new fruits and other plants offered.

New Fruits for Distribution.—Have you read over carefully the list of "new fruits" that are being offered as premiums to our membership the coming spring? They include not only the more valuable of those offered last spring, but also some new ones, the most interesting of which are premium No. 14, the No. 1 raspberry seedling, a week earlier than No. 4, that is doing so wonderfully well everywhere; also premium No. 17, which is a June-bearing strawberry, No. 935, a larger fruit than No. 3, also offered, and somewhat later. Supt. Haralson considers it an extraordinary variety. Premium No. 20, a collection of scions of the new hybrid plum trees, should attract the attention of every one who knows how to topgraft and has any plum trees to graft on. There are twenty lots in this list of premiums, and each member can select two lots. All this is given to a member, besides the annual volume and the magazine for the year.

Our Horticultural Building.—The "building committee" has been very busy up to this date, January 19th, endeavoring to get the building bill in shape so that it might pass the legislature and be enacted into law. A number of meetings of the committee have been had with various members of the legislature, until at the present time the matter stands something as follows: It has been decided between our friends in the Senate Finance Committee and members of the building committee that in order to secure

the necessary appropriation for such a building it will have to be constructed for the Board of Regents of the State University, and under their management and control though on plans practically along the lines suggested by the Horticultural Society, as the purpose of its construction is to provide suitable accommodations for this society and other similar societies who may desire to avail themselves of them. It will contain the two necessary halls, one for the meeting, the other for exhibition purposes, suitable offices for the society, etc., everything necessary to make the building a complete plant for the purposes designed. Any objections on the score of possible unconstitutionality are removed by this change in the form of legislation. Our president, the building committee of our society and the executive board are practically agreed on accepting this change in our plans, and will press the measure along this line in full assurance that we shall meet with success.

Nevertheless it will be necessary for the members to render assistance, which they can do to the greatest advantage by corresponding with their representatives in the legislature.

PASSING OF CAPT. A. H. REED.—The death of Captain Reed, which occurred at his home at Glencoe, Minnesota, Sunday, January 21, removes from our midst one of the most picturesque and at the same time one of the most loyal members the Horticultural Society has ever had.

He became a member of the society first in the year 1884, lending his strong influence from that time on till almost the day of his death for whatever appealed to him as being for the best interests of the society. For many years up to the last two years he was a regular attendant at our annual meetings, taking considerable part in the discussions, and he impressed his personality very strongly upon all who came in contact with him.

For many years Captain Reed conducted a society trial station on his farm at Glencoe, and during a considerable portion of that time maintained a local Horticultural Society in his town. This station at his request was discontinued a year since on account of a severe accident with which he met and which probably contributed to his death.

A biography of Captain Reed was published in the report of this society for 1909, to be found on page 440 of that volume, and with it appears an excellent portrait of this sturdy soldier and pioneer of our state. A frequent correspondence passed between Captain Reed and the writer, the last communication from him being only a short time ago in which he expressed as he ever did his interest in the society and its work.

SECKEL SEEDLING PEAR TREE NO. 1.

Originated by Chas. G. Patten, and now growing on his experiment grounds at Charles City, Ia.

(See opposite page.)

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 MARCH, 1917 No. 3

Origin and Development of Hardy, Blight-Resisting Pears.

CHAS. G. PATTEN, BREEDER OF NEW FRUITS, CHARLES CITY, IA.

In the spring of 1884, almost a third of a century since, it was my good fortune to begin planting a close group of pear trees at Charles City with the purpose of originating trees which would endure the rigors of our northwestern winters.

The investigation was started with two trees of the Longworth pear, which variety originated with Mr. Longworth, at Dubuque, Iowa, and which has since proven to be the most hardy, strictly American pear that has come to the knowledge of experimenters for a long period of years. Close to this tree I set the Russian pear Bessemianka, which was supposed, at that time, to be very hardy and good in quality. On the west of the Longworth, I also set a small sweet pear, the early Bergamot. As soon as this and the Bessemianka began to fruit, they developed blight and were cut out, leaving only so much of the latter as supported a graft of the Lincoln, a large pear, fairly hardy and nearly free from blight.

The following summer found me in a physical break down, and I spent the winter in California and there learned of the excellent Winter Nelis pear. On my return the next spring, a letter awaited me from Mr. O. A. Bardall, of Grundy Center, Iowa, who had become interested in my writings, inviting me to come and see a pear tree that he had which was then five years old.

The two previous winters were of marked severity and had destroyed a large part of the apple orchards of the northwest, Iowa included, but this pear tree at Grundy Center was as sound as though no winter had passed over it. I learned

from Mr. Bardall that this was a Chinese sand pear which was imported by "John S. Collins and Sons," of New Jersey, and supposed by them to bear a large sized fruit but of only cooking quality. Mr. Bardall had a few one-year trees growing, and two years later I planted one of these between the two Longworths, which I had set about twenty feet apart. Close to these I set a Seckel and an Anjou. The Seckel is early and of the highest quality, and the Anjou good and late in season.

Up to this time, I had never seen blight on the Longworth and have seen very little since. I had learned by reading and correspondence with pear growers, mainly in eastern Wisconsin, northern Illinois and in Iowa, that these good pears were reasonably hardy and most free from blight. Thus had I grouped together a combination which I hoped would produce hardy, blight resisting pears for the northwest, and it now seems certain that such a result has been obtained.

In the fall of 1895, I had about one hundred and fifty trees as a result of this experiment. The same fall ill health again sent me to California for the winter. These trees were, unfortunately, transplanted between older apple trees, which considerably retarded their growth, and a railroad cutting through my ground necessitated the removal again of quite a portion of them and with some loss also, but there are now about one thousand two to four year selected seedlings, mainly for use as stocks, and nearly as many cross-bred trees, mostly two years old, from the original one hundred and fifty trees.

The first tree of this Chinese specie was set in my old experiment grounds thirty-two years ago. It is probably Pyrus sinensis. About a dozen varieties have been top-grafted on it. Five or six still remain.

Another specie, brought to this country from China eight years ago, is being experimented on with intense interest in California and Oregon with the hope of securing stocks which are resistant both to blight and the woolly aphis, on which to graft their commercial pears, the common pear stocks or seedlings being subject to both of these enemies. This new specie is known to botanists as Pyrus calleryana and is supposed to be representative of several allied species in China.

The historical part of this work so far may seem tame and quite uninteresting, but I feel sure that it is crowded full of promise for the future of pear growing throughout a large portion of the United States.

The original Chinese trees on my grounds seems as hardy as the best oak but not as adapted to our year round climate as some of my seedlings, which I do not doubt will endure fifty degrees below zero. The old tree, in our hottest summers, loses a part of its foliage, but not so with seventeen out of twenty seedlings which I have. They have splendid foliage and are thoroughly adapted to our climatic conditions.

About three years ago, I sent Rev. John B. Katzner of your society some scions of one of them, and he wrote me in

Cluster of fruit on Warner pear on Chas. G. Patten's experiment grounds.

June last that the mercury sank to forty degrees below zero last winter and that he believed my tree would stand forty-five below, and I feel sure that I have hardier trees among them. One, dominant in Seckel characters in tree and fruit, is in first bearing this year, and is very promising in fruit and for future breeding work.

So much for the extreme hardiness of these trees, and now what I believe to be of more far reaching benefit to our country generally in this breeding problem is their freedom from that most destructive enemy of the pear, "the blight," which sometimes sweeps whole orchards as a fatal epidemic. In 1915, when the blight was severe in several places on my

grounds, out of about two thousand select and cross-bred seedlings not more than twenty-five were struck with blight. Two out of twenty trees, five to seven inches in diameter, had only one small limb touched by it—either in 1914 or 1915, when several seedlings of Pyrus communis, our common pear seedlings, three to four inches in diameter, standing close to these naturally crossed Chinese, were so killed by it that they were dug out.

It is almost impossible for us who do not live in parts of this country where pear growing is on a commercial scale to comprehend the enormous losses sustained by the growers from this blight disease, such as sometimes sweeps over our Siberian crab trees. Prof. M. F. Barrus, of the Department of Plant Pathology, Cornell University, Ithaca, New York, in a bulletin issued last January writes, "Fire blight is without doubt one of the most destructive diseases of pears in this country;" "the losses from this disease amount to millions of dollars every year;" "large blocks of nursery pears are at times absolutely destroyed by it."

It is most destructive to pears and quinces though affecting the apple to some extent, as we of the west are aware. The articles quoted offer no remedy except cutting out the blight vigorously but add that careful cultural methods will help to keep the disease in check. Prof. Barrus says: "When blight infection becomes general in an orchard, efforts at control by removal of infected areas may be unavailing."

From the "California Fruit News" of San Francisco, October 28, 1916, I extract the following: "Pear blight is one of the worst enemies of the pear industry of California and the Pacific Coast. Great efforts were made in this state to check the spread of pear blight and find some effective remedy or control, but little has been accomplished so far except in cutting out and burning of infected trees," and adds, "Many of our agricultural experiment workers through the United States Department of Agriculture and the University of California have devoted much time to work and investigation of this problem."

Referring again to this new species, identified as Calleryana, which has for the last few years been under test at Oroville, California, and which seems practically resistant to blight, I learn that it came from Hongkong, which has a tropical climate, and it is of very questionable value for cold regions,

though we hope it will be of great value for the Pacific Coast.

I am indebted to Mr. F. C. Reimer, superintendent of the Oregon Experiment Station, for information and extent of effort and interest which attaches to securing blight resistant stocks through a large number of the wild species of pear from China. This effort dates only a few years back, while the work at Charles City to breed hardy and blight resistant trees began thirty-two years ago, with a Chinese pear naturally crossed with some of our best and nearest non-blighting American and European pears.

The size of the fruit of the specie which I have, though small, is far larger than this new specie, which is only the size of a large garden pea.

I have here a few views which will help to show the status of the work at the Charles City Station. The first one shown is of a tree which I denominated Seckel No. 1, a seedling of the Seckel which has borne for the last five years in succession, this last year about two bushels. For two years, 1914 and 1915, this tree was surrounded with blight, both on the apple and the pear, and was not touched by it. The fruit is a half larger than its parent Seckel. It is good in quality, hangs well to the tree and is an early bearer, as some budded limbs indicate. Top-worked on this hardy Chinese stock which I have, it should be a success in this latitude (at Minneapolis), as the winter climate here and at Charles City are nearly the same.

The next view is of a Warner pear, top-worked on the Orel, which has borne more or less generally a heavy crop for some six or seven years past and has never blighted. It was blown down on September 5th by a sixty mile wind with its very heavy weight of fruit. This is but one of several experiments with varieties top-worked high up on these blight resisting stocks which have proven quite a success.

The Bezi de Lamott on the old Chinese tree and Winter Nelis on Orel, as also Vermont Beauty, are excellent pears and their uniting smoothly when top-worked on these hardy stocks is of much value.

The last view shows the worker and some of his work.

The study of this fruit breeding problem and the great economic and aesthetic value which attaches to it, led the writer to prepare a paper for the American Pomological Society which met at Tampa, Florida in 1911 on "the adaptation of the pear

to the Mississippi Valley States." Long continued work with this fruit and the cumulating knowledge of the destructive blight has still further impelled me to the study of the subject and an endeavor to learn of varieties which have in them the hereditary power to breed a race of pears suited to the demands of our climate, and it only now awaits the active and material support of the states to hasten the adaptation and development of this most delicious fruit to the great northern basin of the upper Mississippi, and in fact to a large part of the United States.

Chas. G. Patten in his seedling orchard.

It is interesting to note the difference there is between the Seckel Chinese crosses which were bred from the group of trees before mentioned, which are now twenty-four years old, and the smaller parallel row of trees, seedlings of the Keiffer hand-crossed with Winter Nelis. The latter are now seventeen years old. They were crippled by every hard winter, so that most of them died either with cold or blight, while the former with one exception, which has been removed, are apparently as hardy as any forest tree and have never shown a blighted twig.

In conclusion permit me to add that I think that you will happily join me in the knowledge of the discovery so long ago of this highly adapted wild pear, and of the auspicious development which has already been secured through its use in adapting this highly delicious fruit to this great northern basin of the upper Mississippi.

Nevis Trial Station in 1916.

JAS. ARROWOOD, SUPT.

The apple crop was very light. Too much rain in the spring and wind almost destroyed it, excepting a few seedling apple trees that seemed to stand the storms and bore a fair crop. The plum crop was very scattering, though all trees were in a good healthy condition.

In regard to small fruits, strawberries, raspberries, cur-

A wedding party at Mr. Arrowood's. He stands by the post at the right. A glimpse of his orchard adjoining.

rants and gooseberries, they were all good and sold to a ready market at home at a good price.

The Hansen sand cherries are doing fairly well and seem to bear a good fair crop.

In regard to my prunes, they are all first-class and bore a good crop of fruit this year.

The Oregon sweet cherry is doing remarkably well; it bore some fruit. While the fruit may not be as large as some of the other commercial cherries, we believe it will be a success in Northern Minnesota and will be a good substitute for the cherry. It shows every indication of hardiness and is a great beauty.

We would say in regard to the strawberry that Number 3, bred by Mr. Haralson at the Central Station, is a wonderful berry and a leader among all June bearers.

The everbearing strawberries are not as good as we expected, although they bore fairly well. We believe that the Number 3 can be turned into a fall bearer as we kept the blossoms picked off on one plant until after the 20th of July. Then we let it grow, and it bore fruit until winter.

Mr. Wedge, in a few back numbers, suggested that Number 3 should be named after a late Mr. Elliot. Not but what we feel that Mr. Elliot deserves many good things, but we would suggest that it be named after the originator.

Mr. Jas. Arrowood in his hardy plum grove.

We have an acre of raspberries. About one-half are Sunbeams and one-half were bred by Mr. Haralson at the station. They are all very good and are worthy of a place in every garden.

We would suggest that there should be more raspberries and strawberries than there are planted.

Our trees are all going into the winter in good shape. We would say that all seedling trees that have been bred here are leading the old stock of apples and plums.

I am firmly of the opinion that Northern Minnesota never will succeed in the apple business only through the seedling proposition. I find that a great majority of our seedlings are making a better and stronger growth and ripen up their wood in better shape than the old varieties.

Jeffers Trial Station in 1916.

DEWAIN COOK, SUPT.

The spring and summer of 1916 were cold with too much rainy and cloudy weather until some time in July, when it turned very hot, and the dry weather has continued up to the time this report is being made out—November 27th.

We sprayed our trees several times with lime-sulphur solution; still there was considerable scab on some of the fruit and foliage of some varieties of apples, especially Wealthy, Duchess, and Pattens Greening. Yet we had many other varieties that were practically free from apple scab. The apple crop was very heavy; most growers in this section had absolutely no market for their apples, either of the summer or fall varieties.

There are several varieties of apples we have on trial that we believe worthy of special mention. Anisim is one of them. There is also the Starr apple from Vermont. This variety was sent me quite a number of years ago by Mr. Edson Gaylord. It is an improved Patten's Greening, especially as to quality and freedom from scab, cracking and rot fungus. An expert would be bothered to tell them apart on exhibition without sampling their eating quality. The Wolf River and N. W. Greening also seem to be varieties that are making good at this station.

The Hibernal is a success as far as quantity of fruit is concerned, but the quality is so poor for eating out of hand that it is considered of no value here, where better varieties are grown.

The King David is a promising little, hard, red apple that fruited full this season. The Red Queen, an old Russian variety I received from Prof. J. L. Budd, about thirty years ago, we consider one of the most valuable varieties we have growing at this station. Season about with Wealthy, but free from apple scab.

The varieties of fruit from the State Farm we report on as follows:

Strawberries.—Minnesota No. 3 very fine, ranks up with Dunlap in every respect, of better quality.

Minnesota, No. 1017 (Everbearing) very good. We had plenty of fresh strawberries all summer and fall, until after frosts, in spite of the dry season, all grown on plants set last spring. However the new runners did not set any fruit.

Grapes.—Minnesota No. 1, Minnesota No. 2, Minnesota No. 3, and Minnesota No. 7, were not very good, and I think should be discarded, but Minnesota No. 3, Minnesota No. 4, Minnesota No. 6 and Minnesota No. 8 bore a very good crop and appear to be worthy of further trial.

Of plums from the state farm, but little can be said except that they seem all of them to be not very productive. Nine-

Corner of a Minnesota plum orchard.

teen trees, nine varieties, set the spring of 1913, have not as yet borne or, rather, perfected a single specimen of fruit. These trees have been growing four seasons on well manured and well cultivated land in a well sheltered location.

The plum trees from the state farm we set one year later, twenty-one trees, nine varieties, only perfected one specimen. It was found on Minnesota No. 20.

Two varieties of hybrid plums were sent me by C. G. Patten spring of 1914. They were European and Americana crosses. They were labelled "Purple," and "Purple D" and bore freely the past season. Trees appear very hardy, fruit only of medium size, very firm fleshed or, rather, hard, even after falling from

the trees to the ground. One variety is very dark skinned, the other more on the purple order, but both varieties have the genuine markings of the European class of plums.

Of those varieties originated and sent out by Prof. Hansen, the Watesa, Huya, Tapa, Zekanta and Yuteca, all Americana varieties, all bore good crop. We consider the Yuteca the most valuable variety on account of the large size of the fruit as well as its habit of bearing regularly. Of the Hansen hybrid varieties the Waneta is very promising. On a couple of grafts set in the spring of 1914 we got some plums that for size and quality rank with the finest we have ever grown.

The Hanska bore freely, but owing no doubt to too much dry weather during late summer, the fruit was undersized and not of as good quality as it had been other seasons. The other apricot crosses, with perhaps the exception of the Yoka, do not seem to be worthy of any further trial. They appear to lack productiveness.

The Cheresota was very full of fine fruit. Wohanka and Opata gave about one-third of a crop; the other sand cherry hybrids did not produce any fruit to speak of.

Now a few words about the black fleshed sandcherry hybrids. As a class they seem to lack hardiness. The Sapa holds its own only a year or two and then weakens. The Enopa and Etopa kill back considerably every winter. The Wachampa seems to be the only one of the black fleshed varieties that gives at this station any promise of hardiness.

Of Theo. Williams hybrid plums the Emerald, Stella and B. A. Q. still hold their record for productiveness and size of fruit. The B. A. Q. is of rather low grade quality. The Emerald however, is in my opinion of the best quality for eating out of hand of any plum we have ever sampled. Terry and Wyant bore full.

We think spraying our plum trees last spring several times with lime sulphur solution helped us to get our plums sold on the farm at $2.00 per bushel. The sandcherry plums we sold at 10 cents per quart.

The plum crop was almost a total failure all over this part of Minnesota. The ground is the driest I have ever known it to be at this time of the year.

Sauk Rapids Trial Station in 1916.

MRE. JENNIE STAGER, SUPT.

The spring started propitiously. The pussy willows bloomed, and our hearts sang with the birds in the hope of a plenteous harvest of fruit. The plum trees were loaded with blossoms, other fruit buds were coming on, and the air was filled with the fragance exhaled from the opening flowers. Then, unheralded, came a strong north wind which stilled during the night, and when we looked for our blossoms in the morning they were gone with our hopes. But for some unaccountable reason our apple orchard escaped, thereby giving a good amount of fruit.

All of the raspberries sent from the Central Experiment Farm bore well. Number six and number seven had exceptionally large fruit. There were a few berries on the everbearing ones sent last spring but not enough to judge what they will amount to.

Strawberries did fairly well. I planted last spring six new kinds that are highly extolled in the nursery books and, as we had good growing weather, have a fine, clean bed of plants, and I am hoping some may prove extra good. The two-year-old everbearers were better at raising plants than berries, but the young plants taken from that bed and planted last spring showed plenty of fine, large berries in the fall.

Of currants and gooseberries, we had a small crop. One small plum tree about as tall as myself, sent from the Experiment Farm two years ago, had six plums on as large as a crab apple, and of good flavor, and seemed proud of her exploit.

Of vegetables here, potatoes did quite well. Cabbage and cauliflower poor, Lima and some other beans did not get ripe. Tomatoes were large. At our fair I had a plate of Mansfield tree tomatoes that weighed two pounds and over, each specimen. Also some of Livingston's that weighed as much.

Roses were plentiful. I took first premium on Black's gladioli, of which I had a perfectly gorgeous bed, and altogether we had nothing to complain of.

1915 BIRD COUNT IN NORTHWEST.—One hundred and twenty-four pairs of birds nest and raise their families on the average farm of 108 acres in the northeastern states, according to estimates based upon the second annual bird count conducted by the Biological Survey of the U. S. Department of Agriculture.—U. S. Dept. of Agri.

Orchard Spraying in 1916.

HAROLD SIMMONS, FRUIT GROWER, HOWARD LAKE.

The season of 1916 will be remembered by apple growers of Minnesota as the season of seasons, demonstrating the absolute necessity of spraying if one is to conduct apple growing as a business to success.

In the past three or four years I have visited quite a number of Minnesota orchards, and the feature that has impressed me most is the lack of systematic pruning and uniformatory among the trees of different varieties.

Whether it is a lack of knowledge or just plain indifference on the part of the man that suffers the trees to occupy land that might be employed to better advantage, I am unable to tell. They seem to be trusting to the "powers that be" to furnish them a crop of fruit, whether they make any effort to obtain it or not. I should think that the past season would have shown them the futility of trying to grow commercial apples without employing up-to-date methods in pruning, spraying, etc., and that it would stimulate them to make some effort along those lines.

We have sprayed our orchard for eight years consecutively to the best of our knowledge and ability, and the necessity for doing so seems to be emphasized more and more as the seasons roll by.

We sprayed the orchard for the first time the past season as soon as the petals had all fallen, using commercial lime sulphur and arsenate of lead, five quarts of lime sulphur and two pounds of arsenate of lead to fifty gallons of water.

We used an extra fifty pounds pressure this season, running the machine at 250 pounds instead of 200 pounds, as in past seasons. With the extra pressure the work is apparently done better and much quicker.

We deferred the job as long as possible on account of wet weather. We finally had to spray in order to catch the open calyx for the arsenate of lead. It rained two or three times during spraying and was cloudy for several days after. On account of the rain the spray dope did not stick well, yet the foliage was injured quite badly and the spraying did not check the fungus.

Owing to the wet, cloudy weather, it was nearly three weeks after the first spraying before we could spray again.

The second spraying we used no arsenate of lead, just the lime sulphur solution, same strength as before. The weather continued cloudy with very little sunshine for some days after.

Investigation later showed that we had not checked the fungus (scab), but the foliage on some trees was so badly used up that I was afraid to spray again. A still later examina-

Cushman power sprayer, running at 200 lbs. pressure, in Mr. Simmons' orchard.

tion showed that the fungus was almost entirely confined to the leaves. The fruit seemed to be particularly free from it. During picking time this was borne out to a surprising extent. We had some scabby fruit, but a very limited quantity, and that was largely among Pattens and N. W. Greenings.

My experience and observations for the past season have impressed me about as follows:

The Greenings are much more susceptible to the fungus than are red or parti-colored varieties, and the thicker and more dense the trees the harder it is to do an effective job of spraying. Open headed, well pruned trees are sprayed to better advantage, take less material, they dry out quicker, lessening

the liability to damage from burning, fruit is easier picked, color better, and it is invariably larger.

I feel that the long continued cloudy weather during the spraying period was largely responsible for the injured foliage. I also believe that our orchard is pruned harder than any other in the state, it is an annual affair with us, and yet at every apple harvest I am impressed that we have too much wood in the trees. This problem of pruning calls for more judgment than any other operation in the orchard.

If we could do all the pruning in the summer, with the trees in full foliage, it would simplify matters tremendously. But for various reasons that cannot be, and we have to do our pruning in the winter and early spring. It is the seeing the tree without foliage and at the same instant realizing what it will look like next summer, that calls for the exercising of one's best judgment.

The past season the man that sprayed sufficiently to control the fungus did so at the expense of his trees, and if he did not injure his trees he did not control the fungus.

Mr. Powers: Is it advisable to prune any time during the winter?

Mr. Simmons: It is considered that later in the spring it is better but for myself, with so much of it to do, as soon as the apples are out of the way I start to prune, and I prune all winter long. I don't see that it makes any difference.

Mr. Powers: Do you use the powdered arsenate of lead?

Mr. Simmons: We use the paste, simply because it mixes a little easier.

Mr. Powers: I want to ask another question and that is about lime-sulphur. You know there is a dry solution made down at St. Louis and the liquid—which do you consider the best?

Mr. Simmons: I am unable to say, I always use the liquid myself, never used the other. I have used bordeaux.

Mr. Bingham: We have used a great deal of the paste and also the dry arsenate of lead. I find no difference in the two in controlling the apple codling moth or any of the insects except perhaps the paste may stick a little better to the foliage. The dry is much more economical to use, it doesn't waste if you have it left over, while the other is injured by mixing, and I think the arsenate of lead as made today is made very fine and is perhaps more economical to use than the paste. You are paying freight on 50 per cent. water, and in the paste you are not having any loss if left over during the winter, and it mixes very readily with the spray.

Mr. Baldwin: I have found in the matter of spraying the hardest proposition I was up against was to get at the principle. what do I spray for, and I have that one question asked me, I

presume, hundreds of times from different individuals, to know really what they are spraying for. I made quite a study to find out how I was going to get at the codling moth, and I find from the very best and most reliable sources that the codling moth lays it eggs on the leaves and never on the apple itself. We are apt to think that it lays its eggs down in the calyx of that little, small apple, which is not a fact at all. I would think that the second spraying that the gentleman has spoken about, wherein he leaves out the arsenate of lead, to my mind would be a mistake, for the codling moth lays its eggs on the leaf, and we want to get the worm if we possibly can when it first hatches on the leaf, get it on the foliage before it gets to the little apple. My experience shows that after they get into the blossom end of the apple we want to get the spray into the blossom end. There are three or four days it is open to receive this spray. That is the time they all concede we ought to spray, but we do not expect the worm to be in there for some little time. It will take twenty-four days from the time they come out in the spring and go through the mating period and nine days before the worm will hatch, and we have got to have the spray there then. The second spraying can be done more carelessly and with less force then the first spraying, because all we can hope to get is the worm that hatches on the leaves. It will be the same number of worms, but we will get them on the leaves. It is no use spraying the fruit because if we don't get the poison down in the little calyx while it is open we will never get it there, and we will not get the worm.

Mr. Bingham: I would like to say that there is one point that is very well taken. In all of our spraying operations we use arsenate of lead in every spraying because we feel that the expense incurred for a pound of arsenate of lead powder to a barrel of fifty gallons of spray mixture is well expended, because that assures us of getting all the insects that are affecting the foliage as well as, as the gentleman says, the codling moth. We put it in every spray on the cherries and apples up until, perhaps, the last one, which is only for fungous diseases.

Mr. Simmons: In Minnesota I think it is a rare thing for us to have more than one brood of the codling moth, and by spraying and spraying thoroughly so that the spray will drop under the tree, any time from the time the petals fall to eight or ten days after, if the job is done thoroughly, I don't see the necessity of putting any more arsenate of lead on the trees. We have done that for years, the first spraying, and it has always controlled the moths. If you don't have rain during the operation of spraying it is an easy matter. If the spray material gets thoroughly dry on the tree before the rain commences and the spray dope will still be sticking on the tree when you get through in the field, I think the second arsenate of lead application is thrown away.

A Member: I want to get clear in mind, when do you spray first? When the petals are falling?

Mr. Simmons: When the most of them are down.

A Member: When do you spray the second time?

Mr. Simmons: Generally speaking, in about two weeks.

A Member: How about the dormant spray?

Mr. Simmons: I never use it.

A Member: In the spring what is it that kills the foliage, the lime-sulphur or the arsenate of lead?

Mr. Simmons: Lime-sulphur when it doesn't dry good is liable to kill the foliage, but that is only occasionally. The injury two years ago was very slight, but I think, ordinarily speaking, where you get the spray dope to dry out fast on the trees there is no danger of injury when it is used the generally advocated strength, five quarts to fifty gallons.

Mr. Simmons' orchard in full bloom.

Mr. Baldwin: Relative to the second spraying with arsenate of lead. I have used that and used it exclusively, never using a bit of paris green, for twelve or fourteen years. When I spray potatoes I spray them when they are half grown, and then the next lot just as soon as they get new foliage. The bugs would never think of touching the old foliage, they are after the new foliage. We spray the first time before the leaves are half leaved out, and the worms know the difference between the young leaves that are succulent and the old ones. If we don't put poison in the second spraying we have a lot of leaves the worms are going to attack, and there is just the place we want to get them. I think we ought to spray the second time to get the worms; they are not going to eat the old foliage that has the poison on.

Mr. Bingham: I would like to ask the gentleman why he sprays the second time if he does not consider the addition of arsenate of lead of any particular advantage. We know that lime-sulphur in all sections does not control fungous diseases. Why do you spray the second time if you don't use the arsenate of lead with new foliage coming on all the time?

Mr. Simmons: We have never used more than two sprays. It has heretofore killed the fungus, this year it didn't.

Mr. Bingham: Do you find bordeaux any better to control diseases?

Mr. Simmons: I have never used bordeaux mixture.

Mr. Bingham: I would say that we have found a very great difference in the use of lime-sulphur and bordeaux. I believe that lime-sulphur this year was a very expensive spray in many sections. Even at the price of blue vitriol you could better afford to pay twenty cents a pound for vitriol and use bordeaux mixture. We carried on an experiment a few years ago with the use of lime-sulphur and with bordeaux. We had several different plots, and I also did lime-sulphur spraying on my commercial orchard. We had about $500 damage on the lime-sulphur scalding. Our experiment showed that hot weather would cause lime-sulphur injury. We had the experiments side by side; from the bordeaux there was practically no injury and from the lime-sulphur there was considerable injury. The bordeaux rust is not an injury when it comes to market, but when we have the scalding in connection with heat we have trouble.

Mr. Simmons: Where is your orchard located?

Mr. Bingham: Straight east of here, a little south, on the shore of Lake Michigan in Wisconsin.

Mr. Simmons: Climatic conditions are very different, you have a great deal more moisture than we have here.

A Member: Do I understand that the arsenate of lead or bordeaux is a very good spray for a novice, that is, one who has a very few trees; for a general all around spray isn't bordeaux and arsenate of lead good?

The President: We have found it good. Who will answer the question?

Mr. Smith: My experience in spraying is this, that one of the first things, if you are going to have any success or satisfaction out of the spraying, is to know what you are going to spray for, and next, the best time to do it. Now, I just came in and heard the gentleman talking about spraying for codling moth just after the blossom falls. We found that that is very effective, and probably three years out of five if that spraying is done thoroughly enough with 200 or more pounds pressure it will get all the codling moth, just spraying with the arsenate of lead alone. And you will get better results if you spray with arsenate of lead alone, spraying for codling moth, than if you mix anything else with it.

So far as the lime-sulphur and the bordeaux is concerned, there is a general misunderstanding in regard to those two sprays. Lime-sulphur kills whatever it touches. It is a corrosive and kills whatever it touches. We had a good deal of controversy at one time at a horticultural meeting in regard to the matter of using salt with the lime-sulphur and the man advocating it said that it would stay on longer. "Well," I said, "lime-sulphur kills whatever it touches." "Yes." "When?" "When it touches," he

said. "Then will it be any better if it stays on longer?" "Laughter.)

Lime-sulphur is a corrosive that kills any fungi, insect eggs or insects that it touches. It kills them then when it touches them, not tomorrow or next week or anything of that kind. Bordeaux mixture is a fungicide that prevents the growth of fungi, and no fungi will grow there as long as there is any bordeaux mixture present. One is a preventive and the other is a destroying agent; that is the difference between the two. Isn't that right?

Mr. Simmons: Yes, sir.

Mr. Smith: There are insects that eat for a living, like the codling moth and a number of beetles and bugs. Arsenate of lead is a good agent to destroy those because if they taste of it they die, and arsenate of lead will remain for a long time where you put it if it is properly prepared. Lime-sulphur will destroy anything that it touches, and we use that for such things as do not eat for a living but do sucking for it. I have been asked hundreds of times: "What shall I spray my trees with?" The answer is: "What are you going to spray for?" and I am entirely out of sympathy with the idea of mixing sprays. Know what you are going to spray for and the best time to spray for that thing, and then spray for that and you will do a good job. This going hit or miss style—I know one man that went to the trouble of taking every kind of spray material that he saw listed and mixed them all up together and sprayed with it just after his trees were leaved out. The very first thing is to know what you are spraying for, and then you can get from the bulletins of your experiment stations the calendars that will show the period when it is best to spray.

I was a little surprised yesterday when they were discussing the brown rot in plums that somebody didn't say, "Spray with lime-sulphur." I had thirty acres of Italian prunes in 1906; they were very badly affected with brown rot and a great many of those brown-rotted prunes were left on the ground. I got all the information I could on the subject, and the following spring just after the blossoms had fallen I sprayed thoroughly with a mild solution of lime-sulphur, with the result we didn't have any brown rot. Now, I would have thought perhaps that wasn't worth much except for the fact that just over the hill, half a mile from there, there were some trees that were not sprayed, and they had as much rot on them as they had had the year before.

What the gentleman said about this rusting and blistering, and so forth,—weather conditions have a great deal to do with that. I think you can spray with bordeaux mixture when the trees and fruit are dry without much danger of getting any rust from it, but I would never undertake to spray a valuable apple orchard with bordeaux mixture when it was windy and rainy because you are then liable to get the rot from that. (Applause.)

The President: Very much obliged to you, Mr. Smith.

Mr. Baldwin: Don't you think we are lacking in one thing? You go into the great fruit districts, and there they make spraying absolutely compulsory. Inasmuch as our president has something to do with legislation, I should like to have something done in that way whereby we can absolutely make our neighbors spray. I think that could be pushed to the front like it is in other communities, where they will go into a man's orchard and cut it down by law, in the real fruit regions, if he don't spray. It seems to me that in this age when we have so many farmers' organizations, if they would get busy in the winter time and organize in such a way, they could say: "Here, we will hire a man to do the spraying, we will get a good sprayer and then we will see that every tree, or fruit tree, in our locality is sprayed in a professional way by this man who knows how." He can get his spray material at wholesale cost, and then get on a business basis. When we spray in our orchard, and our neighbor does not spray, his rubbish comes over in our orchard, and it makes it pretty hard for us to keep clean. (Applause.)

Mr. Claussen: I agree with my brother here, but for some of us it might be too late. That is the trouble. It isn't like threshing or something like that. I always had the same opinion as Mr. Baldwin.

I want to ask a question. Is there any danger after spraying to let animals in there to eat the grass, where you have clover?

Mr. Bingham: I would like to say one word in regard to the remarks made by the gentleman. We know that bordeaux mixture and lime-sulphur are both good for the same purpose, being fungicides. Now, the lime-sulphur in its concentrated form, as used in a dormant spray, will kill the eggs of certain insects and also the aphis, perhaps, but the lime-sulphur during the summer will not control the aphis. Furthermore, I don't believe that it is absolutely necessary for one man to complain very seriously if his neighbor does not spray. We know that the codling moth does not spread over a great area, and that you can grow good apples right beside an orchard that is neglected, if you do your work thoroughly. There may be the border row that is affected, and a fence between the two orchards will prevent any effect at all. Fire blight is different, that will spread in the general direction of the wind, but those fungous diseases do not travel very far in any direction.

Mr. Rasmussen: I would like to say something as to the value of bordeaux mixture as a general spray. We use it on all our fruit trees, berry bushes, strawberries, celery, squashes, melons, beans, potatoes, about half the vegetables we grow, as a preventive, keep them covered all the time to keep diseases from them. Lime-sulphur is not safe to use on the tender plants. If you have a general run of spraying you will find the bordeaux mixture far more satisfactory, and we always add arsenate of lead to get rid of any insects that come along.

A Member: Do you do it on rose bushes?

Mr. Rasmussen: Yes, sir, try to keep them covered, and you will find out you will not lose the foliage. It is a preventive, you get it on before the trouble starts.

A Member: Put the arsenate of lead in with it on the rose bushes?

Mr. Rasmussen: Yes, sir, it is not necessary to, but we always mix it and the expense is so little we have the arsenate all the time.

Mr. Underwood: There was a question asked whether there is any danger of the spray poisoning anything. We have tried to mow our orchard with sheep and have sixty or seventy-five sheep running in our orchard for the purpose of keeping down the grass. We have sprayed our orchard four times and never saw any symptoms of the sheep being affected at all.

A Member: I will say that I have been raising apples and had calves in the same orchard, and I raised a crop of apples and a crop of calves in the same field.

Annual Meeting, 1916, N. E. Iowa Horticultural Society.

R. E. OLMSTEAD, EXCELSIOR, DELEGATE.

The Northeastern Iowa Horticultural Society met in their 32nd annual meeting at Oelwein, November 15th and 16th. The officers of the society were all present, and the meeting opened as scheduled. The exhibition of fruit was very good, about 300 plates of apples being shown. Considering the season this was a very good display, in fact some of the fruit was very fine. The meetings for both days were especially profitable for one interested in horticultural work. The people of Oelwein did not attend the sessions very much. Mr. Geo. G. Platte had done some fine work in Oelwein in soliciting members to the association, securing some forty or fifty members. The papers and addresses on the whole were very excellent in character, and each one showed thought and study.

Holding the meetings at different cities and towns is probably a good piece of missionary work, as the tendency is to create an interest in the study and work in horticulture in each town in which the society meets. For those reasons it is doubtless a wise provision made whereby the society meets in different towns in its section of the state.

With twenty or thirty good, live horticulturists in session

there is always plenty of material brought forth for a discussion. This meeting was no exception, and the members each and every one seemed alert and equal to the occasion.

But one evening meeting was held, that being in the high school auditorium. Music furnished during the evening by the Girls' High School Glee Club and also two numbers by the Boys' High School Glee Club were especially fine.

Mayor Cole welcomed the horticulturists at Oelwein in a very fitting address. This was responded to by Mr. G. D. Black, formerly of Independence, Iowa, but now of Albert Lea, Minnesota. A duet by Mr. and Mrs. Leo was well received and was responded to with an encore.

Your delegate from the Minnesota State Horticultural Society gave at this meeting an illustrated talk on birds. The impression that your delegate brought from the meeting was to the effect that the meetings might perhaps be better advertised so that the people of the town in which the meeting is held would know that there were some papers and discussions very much worth while, that they were educational and helpful, and that they ought to have a larger hearing.

The Northeastern Iowa Society was very well represented, there being some one from practically each of the larger towns of that section. Mr. Wesley Greene, of Des Moines, read a very fine paper on insects, and in fact, every address and paper given at this meeting was well worth listening to, and your delegate was very glad to be a listener to the splendid program.

That the Northeastern Horticultural Society of Iowa is doing some good work goes without saying. They are a live, wide-awake, stirring body of men and only good things can ultimately come from these gatherings.

WATER REQUIREMENT OF PLANTS.—The study of the water requirement of plants has been continued during the past year with a view of determining the crops and varieties most efficient in the use of water. The differences exhibited in this respect by the principal crop plants are remarkable. Millet, sorghum and corn are the most efficient in the use of water. Wheat and the other small grains form an intermediate group, while alfalfa and other legumes have the highest water requirement. Alfalfa uses about three times as much water as millet in the production of a pound of dry matter when the two crops are grown side by side. Varieties of the same crop show in some instances marked differences in water requirements, so that the careful study of different varieties from this standpoint is a matter of decided economic importance in connection with the agricultural development of dry-land regions.—U. S. Dept. Agri.

Annual Meeting, 1916, South Dakota State Horticultural Society.

M. R. CASHMAN, OWATONNA, DELEGATE.

I arrived at Watertown on the morning of February 16 and proceeded to horticultural headquarters at the Lincoln Hotel. There I met several horticultural acquaintances from Minnesota and South Dakota, including our old friend Professor N. E. Hansen, who is secretary of the South Dakota society.

The sessions started promptly Tuesday morning at 9:30, and with a very few preliminaries the program was soon in full progress. I might mention that I was elected an honorary member of the society and took an active interest in the proceedings throughout the sessions.

Prof. N. E. Hansen, secretary, is to be congratulated upon the splendid numbers included in the programs for each and every day. The papers given were not only interesting for their contents but showed professional knowledge of the subjects discussed.

The state of South Dakota, even more so than Minnesota, has a varied degree of climatic conditions. In the extreme southern portions horticulturists experience little difficulty in growing many of the semi-hardy varieties of apples, while in the central and northern sections none but the hardiest varieties can withstand the severe winters.

There was a very nice display of fruit exhibited in the lobby of the Lincoln Hotel. This display represented three sections in South Dakota; one which included such varieties as Jonathan, Haas, Salome and Malinda came from the vicinity of Vermillion, South Dakota. Another exhibit, from Big Stone, which is just west of Ortonville, Minn., displayed Wealthy, Patten's Greening, Northwestern Greening and Anisim. This collection was grown and exhibited by B. J. Tippet, of Big Stone. Another very remarkable display was exhibited by Mr. John Robertson, of Hot Springs, South Dakota. The orchard from which this fruit was gathered is planted on an elevation of 4,200 feet above sea level.

These exhibits showed conclusively the possibilities of fruit growing in South Dakota. Mr. H. J. Ludlow, of Worthington, Minn., was on the program, and his paper was as usual very interesting and afforded much information on scientific orcharding.

Another paper which was received very enthusiastically was that of Judge L. R. Moyer, of Montevideo, Minn., on "Best Methods in Scientific Improvement." I would be glad to see this paper printed in The Minnesota Horticulturist—for the subject was handled in a very masterly manner.

Professor Beach, of the State College of Iowa, was present and gave several very interesting talks on the marketing of fruits and vegetables. Prof. Beach has a great fund of knowledge on horticultural lines, and his presence always makes this kind of meeting very interesting.

South Dakota is doing much to encourage tree planting in the prairie sections, and to this end they offer a tree bounty for six years for any planter setting from one acre to twelve acres of trees. This tree bounty is calculated to encourage the planting of timber and shelter belts over the prairie sections.

Honorable E. C. Issenhuth, of Redfield, S. D., appeared before the society and read a very fine paper on the "Planting of Groves in the Prairie Sections." Mr. Issenhuth recommended that the state bounty law be amended to extend the period of payment to twelve years instead of six years. To this end, he was made chairman of a committee to draw up such a resolution and present it to the state legislature. Hon. Issenhuth presented this resolution, which was approved by the society and undoubtedly will be incorporated as an amendment to the state bounty law of South Dakota.

The Brookings College, of South Dakota, was well represented, and Prof. N. E. Hansen gave several very interesting lectures on the progress being made in South Dakota through the work of the college. He certainly has the support of every South Dakota horticulturist, and it is well that he should, for he has put South Dakota on the map as the greatest plant-breeding state in the Northwest. His recommendation to enlarge the work at Brookings through increased state aid was enthusiastically received. It is evident that if sufficient funds are furnished the plant-breeding department at Brookings that Prof. Hansen will soon bring out many more new fruits and grains that will mean millions to the northwestern states.

Your delegate enjoyed the trip to Watertown very much and, judging from the enthusiasm and interest shown at the horticultural meeting at all the daily sessions, predicts for South Dakota a very bright future in its horticultural work.

Opening Up the Fruit Farm.

D. E. BINGHAM, FRUIT GROWER, STURGEON BAY, WIS.

Let us take it for granted that your secretary in putting this topic on the program, as he did, had reference more particularly to the tree fruit farm. While the same conditions apply in many instances, in some they differ. For instance, strawberries, and some of the other small fruits, will grow and do well on *good* orchard land and will also grow well on land *not* good orchard land.

D. E. Bingham, Sturgeon Lake, Wis.

It seems to me one of the first points to consider in opening up the fruit farm is selection of the soil, for this is a long time investment, and the soil must have a good foundation. There is danger of disappointment if the subsoil is too sandy, or too wet, a hard-pan, etc. Trees will not do well for long on soil of such character. We prefer a good clay loam with a good clay subsoil of such a nature as to insure good drainage. If we could have some gravel or lime rock in the subsoil all the better.

Suppose we have such a soil, we have other facts to consider also before it is a good orchard site. Air drainage is important. There should be nothing to obstruct the free movement of the air, and the site should have sufficient elevation to insure good drainage.

The soil should not be too rich in nitrogen. Land that would produce a good crop of corn might produce too much wood growth. This must be determined by observing the crops and the growth of the trees; if inclined to be excessive, the fertility should be reduced by cropping.

Planting. The varieties for the orchard, either for cherries

or apples, differ with different localities and different individuals. We all have our notions, and that coupled with the difference in location widens the list of varieties commercially. Four to six varieties for forty acres is sufficient.

I am going to select four varieties and these all red apples, Snow, McIntosh, Dudley and Wealthy. (This for eastern Wisconsin, Secy.) These all have faults, and it is hard to find a variety that hasn't some faults. To those who object to the four I have mentioned I might suggest three or four more, Wagener, Salome, Seek-no-further and Liveland, all with some color.

One must consider the variety somewhat in determining the distance apart to plant. In the Northwest we can plant closer than in a milder climate. Our trees bear young and consequently do not reach the size they do in the East and the Southeast.

We plant Wealthy twenty feet; McIntosh, Snow and Dudley twenty-five feet, Wagener twenty feet, Salome twenty-five feet, Liveland twenty, but if planted in with other varieties twenty-five feet. Were all these varieties to be planted in alternating strips of several rows each, across a piece of land, twenty-five feet would be the distance I would use.

Method of Planting. Our method is first to stake out our land, twenty-five feet square, lining up the stakes so they are in perfect rows, leaving twenty-five to thirty feet margin at the ends for convenience in turning later on. We use the tree placer, of which I have a model. This device insures perfectly straight rows with all sorts of workers.

Holes are dug amply large and deep enough to take in the roots without bending. Long roots are removed or shortened into reasonable length for planting. By using a tree placer and placing it against the stake, then tipping the point back, it can stay in position until the hole is dug and the tree placed in the hole straight up. Then the point is again tipped down, and the tree comes where the stake was.

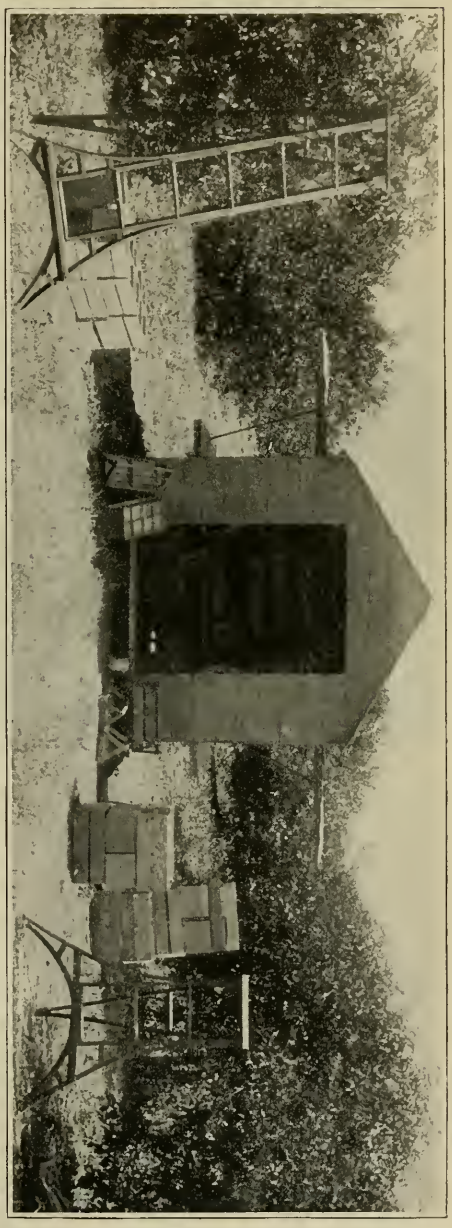
Nursery Stock. In either cherry or apple a two year, five to six foot tree, well branched, medium low head, is about the ideal tree. The reason I choose a two year tree is that the roots are sufficiently large to be woody enough to allow a ready formation of callouses, while the roots on the one year tree will be principally bark and very much slower to callous.

Fall Dug Against Spring Dug Stock. I prefer fall dug stock stored with roots in dirt, not in moss or three-fourths of the

roots may dry out during the winter. We want the mangled end of the roots to heal over, and, what is more important, we do not prune the roots of fall dug stock we plant in the spring. If they are pruned at all it should be done when stored and not after they come out of storage, as nature has healed the wounds, and you should not make new ones.

We should plant early, as soon as land is in good condition to work and before the trees have burst into leaf. Should the terminal buds be open, the tree should be pruned as soon as planted to take off that source of evaporation and keep the tree dormant as long as possible. Our best success is where the pruning and planting are done early and the trees remain dormant till roots have started to grow.

Pruning. Our rule in pruning is three-fourths of the top should be removed in a systematic manner, spacing the limbs right for after years and leaving only a few buds, cutting side branches shorter than the leader and to an outside or a side bud, though this is not absolutely necessary to the future shape of the tree.



A convenient picking shed in cherry orchard of D. E. Bingham, at Sturgeon Bay, Wis.

The second year we can rearrange the head somewhat, and after that the good work should continue every spring.

Cultivation. Should crops be grown in the orchard, the cultivation conforms to the necessities of the crop being grown. Plowing in the spring and six or seven harrowings constitute pretty fair orchard culture. At all events use level culture, that is, do not ridge the tree rows one year and level them down the next. Always level culture. The gang plow, reversible disc, common cutaway disc, spring tooth, are what we use.

We consider early cultivation important at least every other year. On land that is to be built up we use the following method: cultivate till June tenth, then sow clover, a mixture of alfalfa,

Mr. Bingham in his low growing cherry orchard.

red clover and sweet clover, if you please. Leave this till June 1st of the following year, then plow it under. Continue cultivating till August. The next year cultivate till June tenth and repeat.

Winter Protection. When the orchard is young and on an exposed location the snow sometimes blows off and winter injury results. To avoid this if the orchard is being cropped one should sow a strip of oats or allow weeds to grow along the tree row to catch the snow. We have used buckwheat, weeds, oats and clover. After the orchard gets older the danger resulting from no cover crop is less. When there is evidence of field mice the trees should be mounded in the fall.

A Member: Have you had any experience in using dynamite to blast the holes? Will the trees do better in dynamited holes?

Mr. Bingham: That is a question that has been discussed a good deal. We don't use it simply because our soil is of such a nature we wouldn't gain anything by it. In a place where there is danger of poor drainage you can open it up down through that layer. I believe Mr. Kellogg asked the question whether there wouldn't be a cistern formed if you dynamite a hole. I think there is some danger if you don't break that soil clear to a certain extent. If it is clay so the water doesn't penetrate readily, it is more apt to be a water hole.

A Member: When you plant your trees do you set them perpendicular or leaning?

Mr. Bingham: We set them straight up as soon as we can. Those are our instructions, to plant them straight.

A Member: Do you plant them any deeper than they were in the nursery?

Mr. Bingham: Usually about the same depth, or perhaps a little deeper. You must use your judgment. If a tree has a shallow roots we don't like to plant it so deep.

A Member: I would like to make a remark about the trimming of the roots at the time of planting of the tree that is dug in the fall. I remember once I planted some apple trees, and a portion of them didn't seem to start to leaf out or grow until late in July. So I pulled them up with the intention of throwing them away. But I found the roots alive, and they were starting at the ends where they were cut. Some of them had partly decayed. So we cut them off, and we planted them in water and in a short time they grew. After that I always cut the roots in the spring.

Mr. Bingham: I believe that the cut ends of the roots should be allowed to callous over before planting. It seems to me a foolish move to take off the callous that it has taken all winter to form. The ends of the roots should be calloused.

CEDAR RUST ON APPLES.—Cedar rust on apples continues to attract considerable attention and has been severe in certain localities. One of the striking things, however, in orchard pathology has been the fact that in many of the large commercial orchard districts of the eastern Appalachian Mountains, where cedar rust threatened the destruction of the value of the orchards, complete or partial eradication of the cedar trees in the vicinity of the apple orchards, usually within a radius of one mile, has completely solved the problem in the most practical, simple and permanent way and at a very slight expense. While the destruction of the red cedars is to be regretted, this tree in the vicinity of apple orchards has come to be a veritable pest tree, and where the cedar-rust fungus has been specially abundant the necessity for its destruction has been amply demonstrated by the repeated experiences of the past few years.—U. S. Dept. Agri.

Bridge Grafting Fruit Trees.

(A Method of Saving Trees That Have Been Girdled by Mice or Rabbits or Seriously Injured by Blight or Other Diseases.)

To be effective, bridge grafting should be done in the spring before growth starts, though sometimes it can be done after growth starts if dormant scions for the purpose can be secured.

Prepare the wound in the tree by cutting away all dead tissue and thoroughly cleansing the injured parts. If possible, sterilize by washing with a solution of bichloride of mercury, copper sulphate, or some other antiseptic. The irregular edges of the bark above the girdled tract or wound should be cut back into an even edge, far enough from the wound to make certain that healthy cambium is under the bark.

For the grafting, select scions from wood of the previous season's growth, either branches which grew the preceding season or water sprouts that are only a year old. The scion should be a little longer than the space which is to be bridged, so they will arch slightly over the central part of the wound.

Bevel the scions at each end on the same side of the scion with a long sloping cut so that the wedge-shaped ends thus formed will be relatively thin and permit their being thrust well under the bark without danger of separating it unduly from the cambium at the points of insertion. The placing of the scions will be facilitated if the bark at the margins of the wound is slit for a short distance at the points where the ends are to be inserted.

Importance of Uniting Cambium.—In placing the scions it is of the greatest importance that the cambium of the scions which is exposed in the sloping cuts at the ends be brought into intimate contact with the cambium that lies under the bark at the margins of the wounded area. The union of scion and tree can occur only where the cambium layers of the two come together. The scions may be secured in their proper positions, if need be, by driving a small nail through each end into the trunk. This will aid in drawing the cambium of scion and trunk closely together.

The operation is completed by thoroughly covering the area occupied by the ends of the scions and the margins of the wound with grafting wax, strips of waxed cloth, or by some other means that adequately will prevent these parts from

drying out. Some operators cover the entire wound, scions and all, with melted wax. Where the bridged portion is below or near the ground, many operators conserve moisture by covering the grafts with earth.

Bridging From the Ground.—Where the wound is so large as to make ordinary bridge grafting impossible, another method of bridging may be used. Two-year-old trees are planted about the base of the injured tree and their tops grafted into its trunk above the girdled space, which has first been cleaned as in the other method. As the tops of the small trees are too large to manipulate readily in the manner described for scions, V-shaped vertical grooves extending through the cambium are cut just above the wounded area in the bark of the tree to be treated. The tops of the small trees are shaped to correspond with these grooves. The two are then accurately fitted together in such a manner as to bring the cambium of one into contact with that of the other. Small nails may be driven through the tops of the trees into the trunk, to hold the parts firmly together. The wounds incident to joining the tops of the small trees to the trunk of the large one should be well covered with wax, to prevent drying out. Sometimes cord is tied around the trunk to aid in holding the tops of the young trees in proper position.

Investigations of Temperatures of Fruit in Transit.—The results of fruit-handling investigations during the past few seasons show that the most important factor in determining the condition of either fruits or vegetables in transit and after arrival on the market is the temperature maintained in refrigerator cars during transportation. All fresh fruit is alive, and the life activities continue with greater or less rapidity until it goes into consumption; the temperatures maintained in transit determine to a great degree both the rate of ripening and the development of fungi and other decay-producing organisms.

The investigations during the past season have had mainly in view the improvement of refrigerator-car equipment, especially as regards insulation and facilities for free air circulation. The results of the work thus far have shown that through certain modifications in the ice bunkers, through the use of racks or false floors, and through better insulation, it is entirely practicable to increase the efficiency of refrigeration and to haul larger loads of fruit than formerly and with a lesser ice consumption.—U. S. Dept. Agri.

Perennials for Busy People.

MRS. H. B. TILLOTSON, EXCELSIOR.

Every home should have a garden—it is needed just as much as the walks and the lawn. Not only will it help the looks of the house, it will contribute to the health and happiness of its inmates.

I am going to try and tell you how to have a garden with the least possible expenditure of time and labor. I am going to try and convince you that one-half hour spent in good, honest work in the garden each day, after it is well started in the spring, will give you all the flowers you can use in your home and have some left for your friends.

If we are to have but half an hour each day in our garden, time is the most important thing to consider. The garden then should be near the house, and in sight of the rooms where we spend most of our days, so the flowers may be seen from the windows and studied for future arrangement. If you wish to walk through the garden, or rest in your spare moments, it can be easily reached. (By the way, have a seat in a convenient spot). Select a bright, sunny location, well drained, away from trees, of you can, as trees are greedy feeders and seem to know where there is plenty to eat. Their roots reach out much further than their height.

Any soil that will grow corn or potatoes will grow flowers. If some fertilizer is at hand, and you have some one to spread it around, you can grow better flowers, but this is not necessary with the general run of farm soil.

To start your garden, have your ground spaded up in the fall if it is possible; early spring will do if you cannot manage before. Plan everything out on paper now, in January. There is really as much pleasure in planning a garden in the winter as in working in it in the summer.

Send for catalogues and look all of them over. Such a glorious lot of flowers. You will want them all. Carefully select things that come up every year and need to be planted but once. Many times you can get flowers from seeds (and save money) just as quickly as from the purchased roots. Order early and be ready when the spring opens.

I would advise you to buy roots of the peony, iris, bleeding heart, trollius, dictamnus, or gas plant; lily-of-the-valley; and gypsophila, or baby breath; all fine things to have, but the seeds

take from one or two years to germinate and several years before they are in good bloom.

Great help may be had in planning a garden from books and magazines. If you happen to take the "Garden Magazine," much knowledge is to be gained through it's reader's service department, of which you may take advantage. However the one book that will give the most information is Mabel Cabot Sedgwick's "Garden Month by Month." It is a complete dic-

View of Mrs. Tillotson's flower garden from her summer home at Excelsior, Lake Minnetonka.

tionary of hardy plants, which tells their color, height, time of bloom, preferred soil and location. You can get it in most libraries, and by renewing it can be kept a month, long enough to give you a good start.

There are only three things that I can think of that positively must be planted the year before; these are candidum, or Madonna lilies, and Oriental poppies, which should be planted in August; and the peony, after September 15th.

After you have started your seeds early in boxes, pans or a hotbed—if you are fortunate enough to have one—and the little plants are ready to set out, select a cloudy day for transplanting if you can find one. If you cannot find one, soak the

little seedlings thoroughly for two days, make them fairly drunk on water, then take them up, put some more water in the hole where they are to go, spread out the roots and firm them in tight. They will grow without spading. I have forgotten how many thousand plants a good smart person can set out in one hour.

The following suggestions will save much time and labor: Plant in straight rows, or in groups at regular distances apart, so that when you are cultivating you can take a long pull on the hoe. Have a *narrow* hoe, four inches wide, a plain blade on one edge and two prongs on the other. With this you can get into all small places.

Do not let the weeds get ahead of you, or the ground bake hard. You can cultivate 630 square feet of surface in one-half hour. It sounds big, but I can prove it. Once a week is enough, unless the sun shines out very hot after a rain; then you would have to go over it to keep the ground from baking.

Now what kind of flowers shall we plant? Let us take first the early things that establish themselves and live from year to year. First comes the scilla, in blue and white; and the crocus in purple, white and yellow. They make fine borders, increase rapidly and disappear as the summer advances. Arabis, or rock cress, white with its silver grey leaves; and phlox sublata, white or pink, its foliage like green moss, come next and stay after the blossoms are gone. Darwin tulips come in many beautiful colors and will increase for several years. Narcissus poeticus will do the same thing. These are not gone before the iris are in bloom. From the early little purple iris (Pumilla) to the stately and gorgeous Japanese, there is a period of nearly two months of bloom. The German iris are absolutely hardy, come in exquisite colorings, grow almost any place and once planted are good for many years. I can give you the names of a few good ones if you care for them. They are Pladia Del Matica, Madam Chereau, Fairy, Silver King, Her Majesty and H. Darwin.

Next is the peony, so well known it needs no description, just as hardy as the iris and just as easy to grow. You can hardly kill it, and it responds quickly to kind treatment. Once established it is good for ten or fifteen years. With hardy phlox planted between, that particular spot in the garden will be in bloom nearly all summer.

Pyrethum, or Paris daisy, blooms in May and comes in all shades of pink to deep red. Columbine, rocket, sweet william, hollyhock, Shasta daisy, delphinium and garden heliotrope are

all sturdy growers and will take care of themselves. Coreopsis and gaillardia begin to bloom in June and keep it up until frost.

Canterbury bells and foxgloves are biennials, but really deserve a place in your garden just for their beauty. If you start the seeds early in the spring and transplant in June, about half of them will bloom the next summer. This is just as well, because the rest of them will bloom the following year, and the first ones will seed themselves down, thus establishing your succession.

Of the late flowers, that is, from August on, there is the dahlia and the gladioli, classed as perennials in some books. The

Beautiful white peony plant on home place of A. W. Richardson, Howard Lake

hardy aster, golden glow, Chinese lantern plant, pyrethrum uliginosum, boltonia, platycodon and mallow are all fall flowers Delphiniums will bloom the second and third time if cut back each time as soon as the flowers fade. Sometimes you can coax the hardy chrysanthemum to bloom late in September, but it is uncertain, depending entirely on the season.

There are some shrubs that deserve a place in the perennial garden, to be used as a background, or to cover up unsightly spots. Among these are the lilac, snowball, mock orange, spirea Van Houttii, hydrangea and the rugosa rose.

There are a great many splendid perennials that I have not mentioned, not because they do not deserve a place in the hardy garden, but because I know the ones I have talked about give the best results, for the least expenditure of time and labor.

Mandan, N. D., Trial Station in 1916.

W. A. PETERSON, SUPT.

December 4, 1916.—From a horticultural standpoint the season of 1916 was a rather favorable one, even though the rainfall up to date is more than an inch below normal.

There was no late spring frost, and the first fall frost did not appear until September 15, when the temperature went down to 23 degrees Fahrenheit. This sudden drop did considerable

A Mandan, N. D., home—the Virginia creeper a success here.

damage to poplars from cuttings as they were then still growing.

The winter injury that took place at this station during the winter 1915-16 was thoroughly stated in the 1916 mid-summer report from this station.

This summer there has been severe injury from poplar beetles, especially to our trees grown from cuttings. This insect infested poplars and willows alike. Some poplars, especially the silverleaf, are practically immune to injury from this insect. During August almost continuous spraying with lead arsenate was done to keep this pest in check. A power sprayer has been purchased, so the work can be done more effectively in good time

next year. Ash and boxelder and elm from seed made a fair growth this season.

All windbreak combinations as well as all species demonstration blocks of trees have made an excellent growth, both new and older plantings.

All fruit plants, both in permanent plantations, as well as in the nursery, have made excellent growth. An extensive experiment with apple grafts, using various stocks, was started this year, and a good stand was secured with the grafts. In the nursery and orchards oats as a cover crop was seeded August

Early tomatoes, trained and staked, at Mandan, N. D., Station.

first, and this was twelve to fifteen inches tall when killed by frost September 15th.

All apples and plums in the orchard were protected in fall with veneer tree protectors and a liberal mulch of old hay and strawy manure.

Vegetables again were a very decided success. Especially most excellent results were secured with onions, early tomatoes, egg plants, cucumbers and watermelons. It is our firm conviction that the cost of living on the farm can be materially reduced, and the quality raised, by growing all the vegetables under the best system, and canning and storing them for winter use.

All ornamental plants did well. Perennials seem to be especially desirable for this section.

The plant-breeding work is being continued and enlarged at a rapid rate. In fact this is rapidly becoming the main work

of this station, and the possibilities along this line are really very gratifying.

Some of the more uncommon material collected for this work this year includes the following:

3 bu. of native hazelnuts in this vicinity.
8 bu. native plums.
15 bu. native bullberries.
1 qt. native bullberries from absolutely thornless females.
7 absolutely thornless male bullberries.
17 absolutely thornless female bullberries.
5 white fruited Juneberry, native.
1 pk. native H. B. cranberry.

Also liberal amounts of seeds or plants, or both, of black caps, gooseberries, currants, strawberries, choke berries, sand cherries, thornapples and grapes.

Messrs. Peterson and Pfaender, of this station, took an extended trip in September to Ottawa, Arnold Arboretum, Rochester, N. Y., Geneva, N. Y., and other points where large collections of fruits and seeds of Asiatic native species of fruits were collected, especially of pears, apples, plums and thornapples.

Arrangements were made for securing extended lists of plant-breeding materials from these various sources.

Another trip was made in September to the home of Max Schulz, of New Salem, N. D., to inspect and gather information on the top-working of apple trees. Mr. Schulz has, as far as we know, the only large collection of successful top-worked trees in North Dakota. He is successfully growing such varieties as Delicious, McIntosh, Bismarck, Milwaukee and other, top-budded onto Hibernal trees.

On the whole this season has been a very successful one. Complete records are kept on all work done. Failures (of which there are also a good percentage) are recorded as well as successes. We wish to invite all horticulturists who can do so to visit us.

Too Close Cutting Aids Dandelions.—There seems to be a tendency with people who pride themselves in keeping their lawns looking well trimmed to cut the grass too short. This is not a good practice, for two reasons: First the lawn dries up more rapidly when the grass is cut short. Second, when short, it is in the right condition for infection with dandelion and plantain seed.

If the roller of the lawn mower is lowered as far as possible, the grass will not be cut so short, will not dry up so fast, and seed that blows in will not come in contact with the ground but will be held up by the grass-blades and will not germinate. A lawn looks as good if not better if not cut so short.—Carl P. Hopkins, Colorado Agricultural College, Fort Collins, Colorado.

Comparative Value of Pedigree Plants.

PROF. C. B. WALDRON, HORTICULTURIST, AGRI. COLLEGE, N. D.

I am not going to talk on pedigree in plants, but I am going to tell something of the work we have been doing relative to trying out this term what you have seen in horticultural literature, and especially in advertisements, as to pedigree strawberry plants. I needn't call any names; some of you people are familiar with the firms.

We bought a considerable number of strawberry plants four years ago from nurserymen all over the United States, some that used the term pedigree plants and others that did not. Our soil at Fargo is very uniform, and these were grown in small plats, side by side, and, of course, given identical treatment. They were well known varieties, like the Warfield, Dunlap, Lovett, William Belt, etc. We have been selling the fruit of them, and this year we got a pretty good productive test. We found a very great difference in strains of the same variety.

In the Warfield, for instance, we found certain plots that would give us only 42 grams of fruit to the plant, in other plots we found that the plants would average as high as 155 grams to the plant of the same variety. With the Lovett we found a greater difference, from sixteen grams to the plant up to 146 grams, and so on through. With Senator Dunlap we found certain strains running as low as eighty grams to the plant, and from there up to 122.

Well, here is the thing we are looking for, to find out if any of these so-called pedigree plants are any better producers than the common plants that we bought from nurserymen that did not advertise the term pedigree. You are familiar, I suppose, with some of the firms in this country that have been using the term "pedigree" in connection with strawberry plants for quite a number of years. One of these firms that was making the greatest use of it evidently has been doing so without very good authority, because in the case of the Senator Dunlap this particular firm's plants gave only 81 grams to the plant, while another firm which has never made any claims for pedigree plants, their plants gave 122 grams to the plant of the Senator Dunlap, the average through the plot.

The Warfield plants from this same firm that has advertised pedigree plants so persistently gave forty-two grams to the plant, while another hard-working, honest nurseryman, who

never made any claims for pedigree plants, supplied plants that gave 155 grams to the plant.

So at the present writing the claims that are being made for superiority in these so-called pedigree plants are not founded on facts. When it comes to trying them out, you do not get any such results as they claim for them. Of course, as Professor Beach points out, there is a possibility of bud variation. If it has ever occurred in strawberries I don't know of it. There is a possibility in strawberries, but when a man gets it he will know it.

I am not going into the abstract question of pedigree in plants, as I said in the beginning. That has already been discussed some. I discuss it with my students, but I want about a month for that subject usually, five lectures a week and four long weeks, before I can get them to get much of a grasp of the abstract theory of pedigree in plants.

In the Missouri case, in the work with strawberries, at the beginning of these experiments they started with two plots. The plants of one plot were propagated from six very productive plants which produced nearly four times the fruit of the six plants giving very low production from which the plants in the second plot were propagated. Each year propagation was made by bud or runner selection from the least productive plants of the one plot and the most productive plants of the other. These were planted and started in new plots. This brought the most productive plants in one plot and the least productive in the other. This was continued for fifteen years. They always selected the poorest producing plants from one plot and the best from the other.

At the end of fifteen years the same range of variation has continued to exist. You can go into the second plot and get high producing plants and go into the high producing plot (so called) and get poor producing plants. Thus you have no pedigree by selection from bud propagation.

A few minutes ago one of the speakers called attention to the Minnesota 1017 strawberry, that certain plants made runners and others not. There is a difference in the individual plants. Some have the habit of overbearing and others make runners, and that is an individual difference. After five years of careful selection, using the least productive plants in one plot and the highest productive plants in the other, we will have the wide range of variation in plants from the same plot.

You might get pedigree plants in two thousand years or something less, you might get a strain that would eliminate the variation between the individuals, but up to this time it has not come.

With apples, not many years ago we had a very skillful horticulturist with us who advised us to get our scions from the best bearing trees. Well, that may be good advice and it may not be. The man who gave the advice was one of the best horticulturists of this country. We all recognize that fact. Whether he was entirely right in this particular is another matter. In Missouri experiments with apples, scions were propagated from two different lots. The scions in one lot were taken from a Ben Davis apple tree which had been an exceptionally poor producer. Those from the other lot were taken from a Ben Davis apple tree which produced the largest and best apples. The propagated trees yielded three crops. The report doesn't say how many trees were originally put in, but I should imagine that a dozen or so trees were grafted from scions in each one of these plots, one all grafted with scions from the poor producing trees and the other grafted with scions from the good producing trees.

These trees had yielded three crops at the time these conclusions were taken. During this time there was no perceptible difference in size, color, grade or quality of the fruit from these two lots of trees. Impartial observers have been unable to make a distinction as to quality between apples produced in the one lot or the other. The yield from the low-producing parent is slightly less than those from the high-producing parents, but the indications are that there is no more variation between the two lots than there is between individual trees in either plot.,

Now that is as much as we know of the subject at the present time. (Applause.)

MUSKMELON HANDLING.—Investigations in co-operation with the Bureau of Chemistry were inaugurated in 1916 for the purpose of determining the proper time for picking muskmelons and the best methods of handling the crop. The work in California during 1916 demonstrated the necessity of more careful handling. A large percentage of the deterioration in transit and on the market was traced directly to rough handling in the field and in the packing and loading sheds. When melons are picked before ripening, the deterioration is less than in riper fruit, but a large part of the crop reaches the eastern market in a condition unfit for consumption.—U. S. Dept. Agri.

Annual Report, 1916, Vice-President, Second Congressional District.

S. D. RICHARDSON, WINNEBAGO.

Apples.—Very heavy in some places, very poor in others. Some places trees failed to blossom. Why in some places they did not bear and in others bore heavily, under the same conditions apparently, is something I can neither understand nor give any reason for, only record the fact.

Cherries were a failure.

Plums.—Fair crop in some places and failure in others.

Grapes.—Beta was a good crop but not enough vines planted to amount to much of a crop. What few of other varieties, where they were properly cared for, were a good crop, but they require more care and work than the average person will give them.

Blackberries.—Not many raised. In some places where they were covered they were a good crop.

Raspberries.—Same as with blackberry, only in some places the canes were badly diseased.

Strawberries.—Were a good crop, everbearers especially.

There has not been much nursery stock planted, but where it was planted results were good. There has not been much blight reported. In some localities there was some reported after the extreme hot weather of later season.

Have grown blighters and non-blighters so close together that the limbs intermingled but never saw blight caused only by two causes—extreme hot weather or injury to the roots of the tree, and have *effectually banished* blight from the ground by deep tile drainage.

Do not know of any spraying being done, only in the vicinity of Mankato, where it was attended with good results.

All fruits seem to be going into the winter in good condition, although in some localities the subsoil is quite dry.

In some few places apples scabbed badly.

The list of fruits recommended by our society are doing well, also the Surprise plum where it has other varieties to fertilize it properly. Also the N. W. Greening, Salome, Allen's Choice, as hardy, long keeping winter apples.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So. Minneapolis.

Mr. C. N. Ruedlinger, landscape gardener and city forester, has prepared for this society a list of trees, shrubs, vines and flowers that should be planted for fall and winter effect. Each one will add to the attractiveness of the home grounds, either through late flowering, berries, green leaves or colored twigs. These were discussed at length at one of our fall meetings. The list is so valuable that it is printed below and will prove helpful to those who make new plantings this spring.

PLANTING FOR FALL AND WINTER EFFECT.

Shrubs With Attractive Berries.—Snowberry, white; Coral berry, or Indian Currant, red all winter; Common Elder, black; Buckthorn, black; Elder Leaved Buckthorn, black; Burning Bush, red and yellow, September; Common and Purple Barberry, purple all winter; Japanese Barberry, bright red all winter.

Dogwood, Cornus stol, white; alter, dark blue; alba, blueish white; sericea, blueish white. All colored twigs in September.

Thornapple, red; Hydrangea pan.; Sumach.

Wild roses: Rosa Blanda, scarlet; Rosa Lucida, red stems and red fruit; Rosa Humilus; Rosa Rubrafolia, scarlet.

Rugosa Roses.

Arrowwood, Viburnum deutatum, black; Wayfaring Tree, Viburnum lantana, red, turning black; Sheep, or Nanny, Berry, Viburnum lentago, blueish black; H. B. Cranberry, Viburnum opulus, scarlet red, Cotoneaster acutif, foliage and berries all winter; Aronia nigra, foliage and berries all winter.

Vines. Bittersweet, orange yellow, Wild Grape, Clematis paniculata Akebia, carry green leaves well into winter; Woodbine; Matrimony Vine. All attractive berries.

Trees Turning Color. Norway Maple, late green turning yellow; Hard, or Sugar, Maple; Red Oak.

Trees with attractive foliage and twigs. Silver Leaved Poplar, Birches, Yellow, or Golden, Willow; Ginnala Maple, foliage bright red; Tartarian Maple, foliage bright red.

Trees with attractive fruit. Gleditschia-Locust, seed pods; Gymnocladus, Coffee Tree, seed pods; Catalpa, seed pods; Mountain Ash, seed pods.

Evergreens for City. These will not be killed by the smoke. Koster Blue Spruce, Colorado Blue and Green Spruce, Douglas Spruce, Red Cedar, Creeping Cedar, Mugho Pine.

Evergreens for Country. Douglas Spruce, Colorado Blue and Green Spruce, Koster Blue Spruce, Red Cedar, White Spruce, Norway Spruce, White, or Silver, Fir; White Pine, Swiss Pine, Red, or Norway, Pine; Austrian Pine, Buell Pine, Hemlock, Arbor Vitae Thuja, Arbor Vitae Pyramidal Thuja.

Low Evergreens. Mugho Pine, Mountain Pine, Ground Juniper, Sabina Juniper.

Perennials. Giant Daisies, Hardy Asters, Gaillardia, Boltonia, Larkspur, Phlox, Helenium, Helianthus, Veronica, Liatris, Japanese Lantern Plant.

ROSE SEED.

We have been able to secure seed of the rose, Polyantha Multiflora Nana, or Little Midget Rose. It is a tiny, double rose borne in clusters. It blooms the first year from seed but attains a greater perfection the second year. As the seed should be sown in March, it will be given to our members at the meeting of March 9th at the Wilder building, St. Paul. Seed will be sent by mail to those of our members who send the secretary stamped addressed envelopes.

BEE-KEEPER'S COLUMN.

Conducted by L. V. FRANCE, University Farm, St. Prul.

APRIL BEE-KEEPING PROBLEMS IN MINNESOTA.

In the preliminary 1916 Beekeeping Survey of Minnesota, conducted by the University, Division of Bee Culture, we find some interesting information concerning April beekeeping problems in Minnesota. One hundred fifty-seven reports gave information on the particular point of what were the greatest April beekeeping problems.

Bad weather, cold, rainy, cloudy, and windy, seemed to be the greatest evil, as 35.7 per cent. of the reports indicated. Twenty-five other reports named conditions that may be directly influenced by bad weather conditions, as to build up colonies; to keep them warm; to keep colonies strong, spring dwindling; to guard against sudden temperature changes; cold in April and few plants in bloom until in May; and to keep bees in the hives sunny, cold days. Seven reports considered proper windbreaks a spring problem as typified by this answer; to keep hives out of cold winds by windbreaks; the brood gets cold and queen stops laying. Over half, 56 per cent., of the reports thus accuse bad weather as being the greatest April beekeeping problem.

Food and feeding followed next in apparent importance, as 18, or 11.4 per cent., of the reports indicated. Eleven of these reports were classified as "lack of food"; six, "To keep bees supplied with stores," and one report, "Bees are O. K. if honey lasts through April."

Robbing is a spring problem of importance. Thirteen reports, 8.2 per cent., gave robbing as their greatest April beekeeping problem. One answer tells its own story. "No April problems if I feed with narrow entrance."

Lack of pollen was of sufficient importance as a spring problem to claim first attention to six reports, 3.8 per cent. This lack of pollen probably is of very much more importance than indicated by these few reports.

"No April problems," is definitely reported by six parties.

Miscellaneous interesting important answers follow: When to put on summer stands; queenless colonies; to overhaul the hives; trying to handle bees in cold, damp weather; lack of knowing what to do and experience; no thought to any spring problems; time to care for them; spring dwindling; rush of farm work causes bees to be neglected; because of farm work some die from robbing or starvation—many perish when searching for water; cover the hives to protect brood from chills; keep the hives sheltered—see that bees get water and pollen; ignorance is my chief problem; no problems if fall feeding is adequate; I never face them, turn my back and keep out of the way—I think you have asked a lot of unnecessary questions; short of food, old bees die too soon, cold, rainy weather, dwindling, robbing, starvation.

WHAT SHALL I DO IN APRIL?

If the bees are all right in the cellar do not take them out until there is plenty of pollen available close by, willow, soft maple, etc. Many bees will be lost hunting for pollen when none is available close by. If the bees demand removal from the cellar before pollen is available, keep the bees

at home busy carrying in rye flour from a warm nook in the edge of the beeyard until pollen is available.

Give the bees combs of pollen if you have any if there is no pollen available outside the hives or the weather is too bad for the bees to get it.

At the edge of the beeyard in a warm nook somewhere provide good clean water. Have mercy on the bees! Don't let them fly far away in the cold for water. Many perish on such trips. Contract entrances so only two or three bees can pass at a time.

Examine your bees the *first* warm day after removal from the cellar, and if they have not food enough to last till May 20th give them *at once* enough warm sugar syrup or, better, combs of honey saved from last year to last until June 1st. Don't be afraid to give a colony too much food, they won't dump it out of the hive or waste it.

To prevent robbing keep all entrances very small, keep a hive open the shortest length of time possible and don't spill any sugar syrup or honey outside of any hive anywhere. If robber bees pounce into a hive when it is opened, close it immediately and wait three-quarters of an hour or so before proceeding and let the bees quiet down. If a very weak, worthless colony has begun to be robbed, remove everything from the hive but one comb containing *a little* honey, contract entrance to one bee space and let the robber bees gradually take it. Usually the little honey will be robbed out and the robbers will be satisfied. If the whole hive being robbed is removed, the robbers may attack in force the next adjacent colony.

Protect your bees from cold, bad weather until about May 15th or 20th by wrapping each hive closely with several thicknesses of heavy wrapping or building paper or tar paper, leaving the entrance open of course. The bees are used to the protection afforded by the cellar from the cold and wind. No wonder unprotected colonies in Minnesota in April do not "build up" and an unknown number actually dies. Their "overcoats" are removed, and they are set on their summer stands in that condition, with the larger per cent. of the population made up of already old bees, to withstand sudden extreme temperature changes and the spring winds and storms.

This spring, 1917, if you cannot protect all of your colonies, *try it out* on every other colony in your beeyard. See if it pays in honey returns.

Queenless colonies should be united with good colonies by placing above the good colonies with a thickness of newspaper between and protecting the entire two stories with paper. The second story may be removed in about four or five days. Keep the colony protected. In August see that all colonies have laying queens, and the queenless colony problem in the spring will practically disappear.

Also see that all colonies in late September have a great abundance of food, either good light colored honey or sugar syrup. Honey is best of course. "A little too much honey in the fall is just right next spring," is a rule of a certain successful beekeeper which it would be well to follow in Minnesota.

A small number of colonies well cared for in the spring will usually bring more honey returns with less work than a large number with little or no care.

April beekeeping problems will probably vanish if good laying queens and proper food is supplied in the fall, the bees are wintered in a good cellar and sufficient protection to May 20th, and possibly a pollen substitute for a few days is provided. Give the "protection" a good trial this spring and see if it pays in honey returns.

(Part of the "Preliminary Report of the Survey of Minnesota Beekeeping," given at the December, 1916, meeting of the Minnesota Bee Keepers' Association.)

JUNIOR HORTICULTURAL CLUB.

By R. S. Mackintosh, Horticultural Specialist, Agricultural Extension Division, University Farm, St. Paul.

For a number of years the Agricultural Extension Division, co-operating with the U. S. Department of Agriculture, has been conducting contest work with boys and girls in Minnesota. Many successful state wide and local contests have been held and much interest aroused among the young people. At many fairs, farmers' club meetings, and other gatherings, the boys and girls have been given demonstrations in bread making, canning, selecting seed corn, and other interesting and valuable lines of work. Last year there were 10,940 Minnesota boys and girls enrolled in all projects, divided as follows: bread 3,500, corn 2,300, potato 1,260, pig 680, and gardening and canning 3,000. When one realizes the number of persons interested in these activities, he must be impressed with the magnitude and importance of interesting the young folks in such valuable work.

The Minnesota State Horticultural Society has taken a deep interest in the boys and girls who are taking hold of gardening and canning work. One hundred dollars in prizes are offered by this society in 1917, mostly in the form of free trips to the next annual meeting of the society, to aid and stimulate more boys and girls in garden activities. Doubtless this is the most important work ever undertaken by this society in actively supporting the young folks in horticultural work.

In connection with the prizes offered, provision has been made for the organization of the *Junior Horticultural Club* as one of the affiliated organizations of the Horticultural Society, membership to consist of such of these enrolled in the gardening project maintained by the Agricultural Extension Division of the University of Minnesota, boys and girls who pay the annual fee of fifty cents, through their local or state leader, for membership in the Junior Club. In return, each will receive the monthly magazine, the *Minnesota Horticulturist*, published by the Horticultural Society, and some seed or plants free. This means that each will receive much more in value than is contributed. Besides the general horticultural articles in the magazine, there will be a special page devoted to timely gardening notes for the members of the Junior Horticultural Club.

BOYS' AND GIRLS' GARDENING AND CANNING PROJECT—

Outline of garden and canning contest:

Boys and Girls—Age 10 to 18, inclusive.

Project: To grow a garden of a few standard varieties of vegetables and to learn to can and market the products. Size of garden from one square rod to one-tenth of an acre.

What the club members must agree to do:

1. Follow carefully all instructions sent, especially those relating to management of club plat, care, marketing, and canning products.
2. Keep an accurate financial account of all items of expense and receipts. Keep a record of interesting points connected with all work.
3. Fill out the regular crop blank, using pen and ink, and send to local leader or state leader before November 1st, 1917. (The local leader must forward all reports received to the state leader by 6 p. m., November 15, 1917).
4. Give a written story, "My Garden Work."

Basis of awards:

1.	Quality of products produced.....	30
2.	Quality of products canned	25
3.	Cost of growing and canning products..	25
4.	Story "My Garden Work"	20
		100

Send enrollment of clubs and names of new members and write for further information to T. A. Erickson, State Leader of Boys' and Girls' Clubs, University Farm, St. Paul, Minn.

SECRETARY'S CORNER

JUNIOR HORTICULTURAL CLUB.—Your attention is called especially to page 142 of this issue. It will be found very interesting reading—a new field of work opened up in connection with the Society.

REPORT FOR 1902 WANTED.—There is a call from the library of the Agricultural College at Amherst, Mass., for a copy of the 1902 report of this society. This is one of the issues of which our supply is entirely exhausted. Is there any member of the society who would like to furnish us this volume? Address the secretary.

SEE INSIDE FRONT COVER PAGE.—When you do this you will observe that the table of contents is no longer there, but you will find it instead on the inside back cover page. In place of this we have printed on the inside front cover page the material that heretofore has appeared on a pink slip in that vicinity. Dear fellow-member, please give this matter careful attention and let us hear from you promptly.

DON'T REMIT BY CHECK.—Are you aware that nearly all checks that are sent in here in payment of memberships, except those on the Twin Cities and Duluth, cost this society from three to ten cents each to collect? You can safely send a dollar bill for this purpose or for three cents secure a postal order, but if you send a check be sure to add to it an amount sufficient to cover the cost of collecting. Your banker can tell you how much.

REPORTS FROM NO. 1017.—Good reports are coming in from those who are testing the everbearing strawberry seedling, No. 1017, originated at the State Fruit-Breeding Farm.

"The 1017 bore an immense lot of fine berries last summer and fall, and it seems impossible to improve on them."—J. W. Skinner, Beltrami Co.

"Of the plants of No. 1017 I got in 1915, three lived through the winter. It was very dry here in 1914 and 1915. It shows that 1017 is a hardy plant."—W. H. Tomalin, Sask.

LIFE MEMBERS.—There has been considerable number of members added to our life membership roll the current year, in all 21, including those taken at the last annual meeting. Undoubtedly there are others who are considering the matter, and for their information it is stated here that anyone who has paid $1.00 as an annual fee for the year 1917 who wishes to change to a life membership may do so, and the $1.00 already paid will be credited on the life membership fee, making a further payment of $4.00 sufficient for the first semi-annual payment, or $9.00 if paid in full.

NOT ENOUGH ANNUAL REPORTS.—The annual volume of the society, entitled "Trees, Fruits and Flowers of Minnesota," is limited in its issue to three thousand copies, considerably less than the number of our membership, and besides we have to reserve at least three hundred copies for exchanges, public libraries, life members, etc. Fortunately a considerable percentage of the members are not particular about receiving this volume, and it is required that members who do receive it distribute the magazines

received the year before amongst those who would appreciate them—it not being necessary to keep them as the bound volume contains them all. Under the circumstances then we do not send out the annual volume, except when it is directly asked for. To members in Minneapolis it is never mailed except by personal request, the members calling at the office for them as convenient.

WILL YOU RENEW YOUR MEMBERSHIP?—Of course we are very desirous that all members of the society for 1916 should renew membership for the year 1917, and experience proves that the larger proportion will. If, however, you have definitely decided that *you will not renew*, won't you please send a card to this office immediately giving us this information so that we may stop sending you our monthly, it being our practice to continue the names of the members of the previous year on the mailing list for the current year until we hear from them to the contrary. Please give this matter prompt atention, either remitting the annual fee or notifying us of your purpose to discontinue membership.

OUR HORTICULTURAL BUILDING.—We regret not having any information to give as to progress of the legislation which has been started in our State Legislature for the securing of this building. The matter is in the hands of the committees of the two Houses, and since the issue of the February Horticulturist nothing whatever has been done in either committee as far as we are informed. The Executive Board of the society and the Building Committee stand ready to appear before the Legislative Committees in furtherance of this object whenever an opportunity is given to us, which we hope will not be much longer postponed. This does not mean that we consider the situation by any means hopeless. We are entirely confident that the building will be eventually secured, if not at this session of the Legislature, certainly at some other not so very far away, and the chances of its being at the present session we consider most excellent.

APPLE SEED AND ROSA RUGOSA SEED.—The society has on hand a considerable quantity of apple seed secured from the choicest fruit displayed at the late annual meeting. All of the hardy varieties are included in the mixture. Besides this mixture we have a considerable quantity of seed from the Northwestern Greening apple, which can be furnished separately. The Rosa Rugosa seed on hand was secured from selected bushes of the Rosa Rugosa seedlings growing at the State Fruit-Breeding Farm. Any of this seed will be furnished at ten cents per package and directions for care and planting will be sent with each order filled. There is no more interesting pursuit connected with horticulture than growing and bringing to fruitage seedlings of this sort. One never knows whether it is to be the finest fruit ever grown or something of an ordinary character—at least it gives promise of being a hardy tree and especially so if it has never been moved from the place where the seed was planted. Seedling apple trees have a tap root which goes down to perennial moisture. Transplanting such a seedling cuts off this root. Don't transplant your apple seedlings if it can possibly be avoided.

BARREL SPRAYER IN OPERATION AT UNIVERSITY FARM, ST. PAUL.

Lime-sulphur and arsenate of lead is being used as the color of the fruit buds begins to show.

While it is not the intention to publish anything in this magazine that is misleading or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 APRIL, 1917 No. 4

Some Insect Pests of the Orchard.

A. G. RUGGLES, ASSOCIATE ENTOMOLOGIST, UNIVERSITY FARM, ST. PAUL.

When we see nice fruit and hear people talk on the raising of good fruit, it does seem more or less of a sacrilege to come here and disturb your peace of mind and advocate a war. It seems a shame that we must talk about such notoriously bad things as insects. These seemingly insignificant little animals, however, are capable of doing and are always present waiting to "do us ill." It is only when our "fool luck" is with us that we are able to raise good fruit without a fight. It is a fact acknowledged by every one who has studied the problem at all that insects take a toll from the orchardist and gardener of at least twenty per cent. of his crop every year. In a neglected orchard in an old fruit growing region, or in an abandoned garden, you have probably all seen the ninety per cent. or even 100 per cent. destruction. It is the man who has the fight spirit in him who is going to win. It is the offensive army that always has the advantage, and to take the offensive we must be prepared. To be prepared one must first recognize the enemy as an enemy, and then must know the kind of ammunition to use, whether it is to be gas, poisons or cultural methods.

About 500 species of insects have been recorded as feeding on the apple alone. Fortunately, only a few of these are very injurious. A number of the extremely injurious ones have not yet reached the state, or if here are not numerous enough to do damage, though undoubtedly they will later. Hence the need of preparedness, the only alternative being to quit the business. Knowledge of the enemy, timeliness and thoroughness in spraying or cultural methods are the requisites for success.

I shall only mention four of our greatest insect pests of the apple and plum, namely: codling worm, plum curculio, scale insects, plant lice.

The Codling Worm is always with us. East or west, north or south, this is the worst pest of the fruit of the apple tree. Like many other bad pests, it is an imported variety, not a native of America. In working against this insect we literally take the offensive, because the valuable spray is given ten days or two weeks before the insects appear. The worms have a habit of finding the blossom end of the fruit and starting their operations from that end. The moths that lay the eggs fly a week after the blossoms drop, and the larvae hatching from these work their way through the closed bracts of the blossom and begin feeding in the calyx cup. If we should spray at the time these worms are working, our poison would do no good, because we could not reach their feeding grounds. The time to spray is just as the petals have fallen, and while the calyx cup is wide open. The material to use in the spray is arsenate of lead.

The Plum Curculio. The damage done by this insect is by the adult. When working on apples they disfigure the fruit, while in plums they produce worms, which feed upon the pulp, causing the fruit to drop. These forms hibernate as adult insects and come out fairly hungry in the spring, when they often eat the opening buds and young leaves. As the fruit begins to form the females begin depositing their eggs in the crescent-shaped marks that you all have noticed. About the first of August, or about the time the plums begin to show color, adult beetles are seen again. At this time they feed on the fruit, making nice openings for the spores of brown rot and other diseases to enter. Spraying with arsenate of lead at the time these forms are feeding and egg laying will keep the insects in check.

Scale Insects. There are three very important scale insects found in Minnesota, the San Jose scale being the most dangerous. This insect has been found in a few places in the state but has not yet secured a good foothold in any orchard. The Oyster Shell scale and the Scurfy scale have been present here for a number of years, and often we see large trees badly damaged or killed by them. Scale insects are sucking forms of insect life. Besides this they have an armor-like or scale protection. This makes them doubly hard to combat. However, the dormant spray of lime sulphur will control the pests. The action of this material is somewhat different on the different scales. With the San Jose scale, where the insect goes through the winter under the scale, the lime sulphur softens the edge of the scales and along with other chemical actions practically suffocates the insects. The

Scurfy scale and the Oyster Shell scale on the other hand pass the winter as eggs under this armor-like covering. The lime sulphur when applied to these forms seems to loosen the scale from the bark, which allows the wind to blow them off along with their numerous eggs.

Plant Lice, or Aphides. These forms winter as eggs on the twigs. The little black, shiny specks seen around the buds on the twigs and the lenticels on the bark of the trunk during the dormant season are the eggs of these forms. In the spring these hatch and, reproducing very rapidly, are able to do a lot of damage by sucking the nourishment from the growing leaves and the blossom buds. In our experimental work we have found that a nicotine product, called sulphate of nicotine, is an almost perfect plant louse insecticide. It has given much better results than kerosene emulsion, whale oil soap, or any other of the contact insecticides. Unfortunately this product cannot be made at home. It is a commercial product, and is put on the market under such trade names as "Black Leaf 40," "Black Leaf 20," "Nicoticide" and "Sulphate of Nicotine."

Combination Sprays. It is very fortunate that we do not have to spray for insects and diseases at separate times. Almost always it is best to make a combination of fungicide and insecticide. Lime sulphur used at the summer strength, (1 to 40) is a fungicide. Arsenate of lead, used at the rate of 2½ pounds to three pounds of the paste, or 1¼ to 1½ pounds of the powder, in a fifty gallon barrel of liquid, is an excellent insecticide for biting insects. These two can be combined making an excellent spray. If plant lice are present when this spray is to be used one-half a pint of Sulphate of Nicotine can be added to the spray liquid in a fifty-gallon barrel. In a combination of this kind, therefore, we have a material that will kill the disease, a material that will kill the eating insects, and a material that will act on the sucking insects. This is as near the ideal spray as we can hope to get.

The number of sprays to use during a season would probably average three. Unless scale insects are present we never recommend the use of the dormant spray of lime sulphur. For scab, plum curculio and plant lice this combination spray should be used first as the blossoms begin to show color. The second spray should be given just as the petals have fallen, and the third spray should be given three or four weeks later, or in case of plums just as the fruit begins to show color.

Concentrated Lime Sulphur. This material can be made at home, as has been shown in a number of the past reports in the Horticulturist. It is much simpler to buy it on the market, but in any case the material should be tested before used. The material sent out by any of the most reliable firms if left uncovered will change its composition more or less. To test one should have what is called a Baume Specific Gravity Scale, or Hydrometer. These can be purchased for $1 or $1.50 from any large drug company, such as Noyes Bros. and Cutler, St. Paul, or Bausch and Lomb Optical Co., Rochester, N. Y. To get the right amount of dilution, one must have a dilution table such as given in any bulletin or book where lime sulphur is discussed. For instance, if a Baume reading was thirty-two degrees, and you are going to use a dormant spray, you would dilute one part of the liquid with eight parts of water; if you are going to use a summer spray, you would dilute one part of the lime sulphur with forty parts of water. The following table will show the amount of dilution to use with a reading anywhere from fourteen degrees to thirty-five degrees:

DILUTIONS FOR DORMANT AND SUMMER SPRAYING WITH LIME SULPHUR.

Reading on Hydrometer.	Amount of dilution. Number of gallons of water to the gallon of lime sulphur.	
Degrees Baume.	For San Jose Scale. Dormant.	For Summer spraying of apples.
35	9	45
34	8¾	43¼
33	8¼	41½
32	8	40
31	7½	37¾
30	7¼	36¼
29	6¾	34¼
28	6½	32¾
27	6	31
26	5¾	29½
25	5¼	27¾
24	5	26
23	4½	24¼
22	4¼	22¾
21	3¾	21¼
20	3½	19¾
19	3¼	18¼
18	3	17
17	2¾	16
16	2½	15
15	2¼	14
14	2	12¾

Mr. Kellogg: I wish to ask if the plum curculio does not hatch before any foliage comes out?

Prof. Ruggles: The plum curculio winters over in an adult condition. They do not do any damage until the fruit is present, but they do feed a little upon the opening bud and the young leaves, so the only way you could get them is to put the arsenate of lead spray on the leaves and buds, so they will eat it. The dormant spray will not do much good.

Mr. Kellogg: Could you kill them better then than afterwards?

Prof. Ruggles: Better as the fruit begins to form.

Mr. Baldwin: Most of us buy the commercial lime-sulphur. Is there any reason why we should not insist on their giving us the readings of the strength?

Prof. Ruggles: Almost all the reliable firms do that. The specific gravity readings are given on the container and tell you what dilution to make, and most of them tell the whole truth.

LAWNS.—The proper time to reseed the lawn is a much mooted question. It is the practice of the writer to get busy as early in August as conditions will allow. Constant attention is the price of a good lawn, and one must patch up the bare spots as soon as possible. One of the reasons set forth against August seeding of lawns is that we usually have a spell of dry weather at this time. We can, however, expect rains in early September, and by seeding near the end of the month there is not much chance of failure. Last year I seeded a lawn in August, and for several nights thereafter it rained hard. A splendid lawn was the result. Weed growth is practically completed by this period of the year, so one does not find so many weeds in an August sown lawn as is usually the case with spring sown ones.

CRANBERRY CULTURE.—"The proper soil for the culture of this berry is a peaty alluvial soil. A peat bog, if not too deep, or any black land on which wild bog cranberries now grow will present a suitable home for the cultivated berry. Beds are sometimes made on an ordinary, very sandy loam, but such soil requires the annual application of commercial fertilizer, which is not required on black soil. Moreover, ordinary soil runs more to weeds than a peat soil does. A wet soil with the water just below the surface should be selected. If land of this character is ditched and drained until the water recedes to within twelve inches of the surface the results will be satisfactory."—Canadian Horticulturist.

Increase the vitality and the fruit-bearing ability of squashes, pumpkins and melons by restricting the vine growth. As a rule the vines tend to spread a great deal more than is necessary. Prevent this spreading by snipping off the tip ends of the vines, preferably with a sharp knife, close to, but just beyond a leaf stem.

Montevideo Trial Station in 1916.

LYCURGUS R. MOYER, SUPT.

Perhaps there is no class of trees more enjoyed by the flat-headed borer than the Hansen hybrid plums. The bark seems to be especially juicy and attractive to them. One must watch the trees continually and dig out the pests, or very soon the trees will be gone.

Among the Minnesota plum hybrids, No. 10 is very promising. It ripens early, and in quality seems to be equal to the Surprise. Its fruit is large and fine looking.

No. 81 is a much later plum, but it is of good quality too and of fine appearance.

Trees of No. 8 and No. 10 have been fiercely attacked by the plum borer as well as have the sand cherry hybrids. One of the puzzles is how to protect these low growing trees from the depredations of the cottontail rabbits. The rabbits are a worse pest than the borers.

Ohta appears to be the best of the red raspberries. It is reasonably early, large, of fine quality and a good yielder. It has been laid down and covered every winter, so that we do not know how hardy it is.

Minnesota No. 8 raspberry is a late berry ad promises to be valuable; but this year a period of dry, hot weather came on as it was about to mature its crop, and the result was a failure.

When Minnesota No. 3, No. 4 and No. 5 raspberries were sent out, they were sent under restriction, no plants to be distributed. The plants were set in the open prairie, but protected by a tall hedge of lilac bushes on the west and by a thick growth of pines on the east. The rows became very much matted, the plants crowding each other in the row. They were not laid down, but were drifted under by an early snow and remained deeply covered all winter. They bore no crop. They have now been thinned out, and part of the rows have been covered with earth and part with half rotted straw. If they do not do better next year we shall discard them.

At this writing it does not seem probable that the everbearing strawberries will ever be very successful in Southwestern Minnesota. These strawberries ripen at the time of the year when we are very apt to have a drought, and unless the grower has means of watering at hand he is likely to see his crop dry up and perish. That was the case with the crop on Minnesota No. 1017 this year.

In 1905 we received from Prof. Green twelve apple trees budded on Pyrus baccata (Malus baccata). No. 1, Hibernal died in 1905. No. 2, Patten's Greening, is a healthy tree, 19 feet high, with a spread of 12 feet, but the leaves have been somewhat affected by the cluster-cup fungus. Two juniper trees are distant about thirty feet to the east and two others about sixty feet to the west. No. 3, Oldenburg, died in 1905. No. 4, Wealthy, is 20 feet high and has a spread of 12 feet. It shows sunscald about 18 inches long on the south side, and suffers greatly from shothole fungus. Two junipers stand about sixty feet to the northwest, and two more about the same distance east. The junipers

Winter picture of a splendid evergreen windbreak at the Montevideo Station.

were full of the characteristic "apples" last winter, but do not show any this winter. No. 5, Oldenburg, died in 1905. No. 6, Charlamoff, died in 1907. No. 7, Patten's Greening, is a very healthy tree, with a height of eighteen feet and a spread of 18 feet. It produced about three bushels of apples last summer. No. 8, Patten's Greening, is a healthy tree, about as tall as the other, but with not quite so wide a spread. It produced about two bushels of apples last summer. No. 9, Wealthy, became loose about the roots some years ago and had to be staked up. It has since been damaged by rabbits above the wood-veneer protection. It is about twelve feet high and has a spread of four feet. The fruit on the tree did not mature. No. 10, Hibernal, is healthy, with a height of fifteen feet and a spread of sixteen feet. It produced about three bushels of apples. There is a small sunscald near the ground on the southwest side. No. 11, Hibernal, died in 1905. No. 12, Oldenburg, is about twenty feet high, and has a spread of 12 feet. It produced about a bushel of fine apples, but it has blighted this year all around near the ground and will

die. This trial, which has now continued for eleven years, seems to show that Patten's Greening is most congenial on crap-apple stock, and that Hibernal comes next. Wealthy might have done something had it not been for the juniper trees that served as the winter host for the gymnosporangium. The trees all received garden cultivation, but the result does not show the Pyrus baccata stock is better than the root-grafted trees with the common piece-root stock. In the case of the Oldenburg tree the stock seems to have blighted, although there was very little blight in the orchard except on one tree from Ames, marked Snd. 1.

No. 327 Ames is evidently a seedling of the Hibernal. It is equally hardy, bears well, and produces a large, sour, juicy apple, better in quality than the Hibernal, and not so subject to scab.

No. Snd. 1, Ames, comes in a week or two later than the Oldenburg, bears a beautiful looking apple, one-fourth larger than the Oldenburg and of much better quality than the Okabena. The trees show a little blight.

Since Anisim has come into bearing with us, it has become a favorite eating apple. It is small, but in quality it compares favorably with a Washington Jonathan. In a cool cellar it will keep until January.

Opinions differ as to whether our wild high bush cranberry is different from Viburnum opulus of Europe and Asia. The American form of the shrub was called Viburnum americanum by Miller as long ago as 1768. It seems to be absent from the southwestern part of the state, but it was collected by Taylor at Glenwood about thirty years ago. I have seen it growing in the woods on the "Leaf Mountains" in Otter Tail county, where it is a beautiful shrub. It is worthy of cultivation anywhere. In the old volumes of "Garden and Forest" reports were made about a form of this shrub raised from seed obtained from the mountains about Pekin. We presume it was this form that was sent out by Prof. Green some years ago as Viburnum pekinensis. As growing at this station Viburnum pekinensis seems to be a larger and more luxuriant bush than Viburnum opulus. It has larger and longer leaves. When touched with the frosts of autumn its leaves turn to a coppery red. The large cymes of bright red fruit combine well with the leaves and make the plant a striking object.

Caragana pygmae is a native of Siberia and Thibet. Coming from a dry, cold climate it is well adapted to our Northwestern prairies. It belongs to the section of the genus having but four leaflets. It is a low spreading bush well adapted to foundation planting. It is readily propagated by root sprouts or seeds.

Caragana frutex was formerly called Caragana frutescens. It is a slender, upright shrub growing to about half the height of Caragana arborescens. It also has leaves with four approximate leaflets. It makes an attractive screen growing to the height of about six feet. It is native from Southern Russia to China and is hardy at Montevideo.

Raspberry Culture.

A. O. HAWKINS, NURSERYMAN AND FRUIT GROWER, EXCELSIOR.

Raspberries may be planted in rows six feet apart and three feet in the row, or they may be planted in rows five feet apart and four feet in the row, so that they may be cultivated both ways. They may be planted either late in the fall or early in the spring. Fall planting is preferable when the ground has been soaked with heavy rains. There is no danger of winter killing when roots freeze up in wet ground. A fall like the one just past (1916) was very injurious to the raspberry plants, as the ground froze up with entirely too little moisture in the soil. Nothing but plants of one season's growth should be used, and care should be taken in selecting plants that are free from root knot and crown gall. Before planting the canes should be cut back to within eight or ten inches from the root, so that the vitality of the plant will go into the new growth which comes from the root. Set the plants with the crown about one inch below the surface of the ground and tramp the soil down firmly over the roots. Cultivate shallow once a week until about the middle of September. The best cultivator to use is a harrow-tooth cultivator with a sixteen-inch sweep. A sweep wider than sixteen inches is not desirable. As soon as the plants are through fruiting, cut out all the canes that have fruited and burn at once. If this is neglected insects and diseases will sooner or later ruin the plantation. The writer has not found it profitable to keep a raspberry patch more than three years. Planted in new ground they yield the most. Where the soil is not rich it should be made so by applying a heavy coat of manure between the plants as soon as they are planted. One good application will be enough for three years. Fertilizer applied after the first year will have a tendency to bring the feeding roots too near to the surface of the ground and make the canes too soft to stand winter injury. In this state most varieties need winter protection. Cover all the canes with earth any time after October fifteenth.

The following varieties need winter protection for best results: King, Marlboro, Cuthbert, Columbian, Golden Queen and all the Black Cap varieties.

Varieties that are doing well without winter protection are: Number Four, Idaho and St. Regis. By far the best variety ever fruited by the writer is Number Four. This variety originated

at the state experimental station at Excelsior, Minn. The bush is perfectly hardy and is a tall, vigorous grower. Fruit is much larger than King or Miller. Color is a light crimson, firm and of good quality. It is a good canning berry, a good shipper and productive. It does not cling to the stem like Loudon and does not drop or crumble like the King.

A Member: Will you please repeat the name of the raspberry you speak of?

Mr. Hawkins: Minnesota No. 4?

The President: That is one of Mr. Haralson's new creations. Any other questions?

Mr. Sauter: He said that he covered up the King. We do not cover them. I think they are just as hardy as the No. 4.

Mr. Hawkins: I think at two or three years old they are not as hardy. Three years is all I think it is profitable to grow them.

Mr. Rasmussen: My experience is different. I think at eight to ten years they would be in their prime.

Prof. Dorsey: I might say that up at Bay Lake, Professor ———— has a raspberry bed that has been in sixteen years, and they do not show any inclination to decrease in yield. Fifteen years ought to be a conservative figure for the yield of a raspberry bed.

A Member: How many years have you had the No. 4?

Mr. Hawkins: I have only had them three years.

Mr. Kellogg: You cover the whole cane?

Mr. Hawkins: Yes, sir.

A Member: The speaker spoke of the Columbian raspberry as needing cover in this section. For three years my Columbians have produced a cane eight or ten feet high, and no protection whatever except a few trees not far away. They have borne immense crops, so much so I have taken a fancy to the purple caps and ordered some new canes. I would like to know if the Haymarket and the Black Pearl are hardy. I like the purple caps; I find the Columbian hardy.

Mr. Hawkins: Don't they kill back to the snow line?

A Member: No.

Mr. Hawkins: They generally do with me.

Mr. Black: I just want to say that my experiments have all been made down at Independence, Iowa,—this is at least 150 miles south of here—and I found that the Columbian raspberry, unless it is a very mild winter, would kill to the snow line at least two winters out of four. During a mild winter they will stand it, but take an average cold winter, and they kill to the snow line with me down at Independence.

Mr. Rasmussen: How about spraying your raspberries?

Mr. Hawkins: We have never tried that.

Mr. Rasmussen: We use two or three sprayings of bordeau mixture. We think it is more necessary on the raspberries than on anything else.

Mr. Brackett: I agree with Mr. Hawkins on the No. 4 raspberry. It has done so well with me that I have plowed everything else under. Some of the neighbors that have planted it have been greatly pleased. I will venture to say that if you get our No. 4, from the Experiment Station, you will never grow anything else. (Applause.)

A Member: Another man and I put out two thousand plants of the St. Regis, which had been recommended to us. This fall we didn't get any fruit. I would like to know the experience of fruit growers this season.

Mr. Rasmussen: I think they are the finest bush in the world, but they grow no fruit buds.

Mr. Hawkins: We had a very hot spell, and I think that was the reason they didn't set any fruit buds.

A Member: How many crates do you pick an acre, on good land?

Mr. Hawkins: On good land it would be about two hundred crates to the acre.

The President: You notice that Mr. Hawkins emphasizes good land. Good land goes a long ways when it comes to growing all that kind of fruit.

Duluth Trial Station in 1916.

W. J. THOMPSON, SUPT.

No new work was started. The orchard of apples, plums and cherries selected from the society list for our region, and set out in 1915, was carefully pruned and cultivated through the summer. Good growth was secured. The worst loss in 1915-1916 winter was observed in the Hibernal and Anisim stock. Experiments in blasting holes for trees gave no noticeable differences in quantity of growth as yet, but it was a great labor saving device. Fully one-half time was saved, besides the rather hard pan type of clay was thoroughly broken. Rutabagas were grown between the trees during the summer. This fall a cover crop of rye was seeded after disking the land thoroughly. It is planned to turn these under for green manure and follow with rutabagas in 1917.

LOWERING COSTS OF POTATO PRODUCTION.—Fifty years ago an acre of potatoes yielding 110 bushels required fifty-five hours of man labor. Now an acre yielding 220 bushels requires but thirty-eight hours,—thanks to the potato planter and digger. One man with a good planter can open the rows, distribute the fertilizer, drop the tubers and cover them over an area of three to five acres each day. Planters are now being used in many communities and a greater area covered. Best methods of cultivation and fertilization assist in reducing the cost per bushel of growing potatoes, at the same time increasing the yields.—Henry G. Bell.

Some Native Shrubs and Their Uses.

ERNEST MEYER, ROSE GROWER, MINNEAPOLIS PARK BOARD.

Through our woods, especially along the edges, around low places and swamps, along roads and railroad right-of-way, or wherever the trees have been cut down for some reason or other, or the ground is too rough for cultivation, or neglected for other reasons, we find an abundance of native shrubs suitable for the decoration of our home grounds, equal and often superior to the horticultural varieties.

Whoever is able to distinguish the different kinds in their dormant state may collect enough of them for his plantings, if time is no object and facilities for transportation are at hand. Otherwise, they may be bought at some of the nurseries; especially the ones that are also catering to landscape work.

Of course, one is apt to hear the remark, "I wouldn't have that in my yard, it grows all over the woods." A remark that sounds just as much out of place to me as, for instance, "I wouldn't have such and such an article. Why, it was made right here in town." The types of all shrubs are native somewhere, and why should we despise the ones that grow all around us more than the ones that come from China or Japan? People who live in the suburbs and in the country, and the farmer who is wise enough to improve his place by the judicious planting of shrubs, trees, vines, evergreens and flowers, be it for the sake of just making his place more beautiful or to add to its future value, or for both reasons, will achieve better results and create a more harmonious effect by using our native shrubs and vines.

The nurserymen and landscape architects, laying out big country estates, are making some use of them, but do not always use the full collection, probably because some of them are rather scarce and difficult to procure. This, however, should not excuse our nurserymen from having them, even if they should have to keep their own stock plants to propagate from. By using such shrubs for the planting out of their own yards and buildings, they would give, also, an object lesson to prospective customers.

The most common and most widely distributed shrub is the Meadow Rose. It is, at the same time, one of the best all around shrubs. It thrives in either sunny or shady exposure, and in almost pure sand, but, of course, it also responds to good treatment. In June and July it is loaded with pink blossoms two to two and one-half inches in diameter, and later in the season, and

even in the winter, adds a touch of color to the landscape with its abundant crop of rose-hips and its red twigs.

Another shrub for winter effect is the Red-Twigged Dogwood, found in low and moist places, also helping considerably to brighten up the sombre aspect of our tamarack swamps in the winter time. It adapts itself to any kind of soil if not too dry and is often used for hedges, but there is other material better adapted to this purpose. It is valuable in shrubbery planting and blooms most all summer. Before the last of the flowers have disappeared, the white berries already add to its decorativeness.

Almost identical, but of a more upright growth, is Bailey's Dogwood.

More stately and bold in appearance, and of a very distinct habit, is the Alternate Leaved Dogwood. Its branches are arranged in irregular whorls, forming flat, horizontally-spreading tiers, especially noticeable in winter time. It is equally attractive, with its white blossoms and, later on, with its metallic blue berries.

A lower grower, and already, for this particular reason, a valuable shrub, is the Panicled, or Gray, Dogwood, a well shaped shrub, with good, healthy foliage. It thrives in both sunny and shady positions, is a prolific bloomer and fruit bearer, and its white or bluish-white berries are borne on red stems, forming a rather pretty contrast.

A branch of sand cherry in fruitage a wonderfully prolific bearer.

Further, we have the Silky Dogwood, with purple branches and dark blue berries, and the Round, or Big Leaved, Dogwood, with light blue berries on light purplish, brown spotted twigs.

The family of the Viburnums furnishes us with a considerable number of fine shrubs, as, for instance, the well-known High-bush Cranberry, with its pretty white flowers, its brilliant red fruit and its gorgeous fall coloring.

The Sheepberry, or Nannyberry, and the Black Haw are two similar kinds. The former distinguishes itself by its larger size, larger leaves, and longer pointed end buds, from the latter. They are among the most conspicuous shrubs when in bloom. The shiny leaves take on a beautiful color in the fall, and at the same time the bushes are loaded with bunches of big, bluish-black berries.

Flower cluster on native sheepberry (viburnum lentago.)

The Withe Rod has flowers and fruit almost like those of the preceding species and is even more useful, being a lower grower. The same is true about the Dockmackie, or Pursh. It grows in abundance wherever it has a chance but is seldom offered in the trade.

Less conspicuous for their fall coloring, but more so for their fruit and general appearance, are the Arrowwood, Big Arrowwood and Hobble-Bush.

Our earliest flowering shrub in the spring is the Red-Berried Elder. In fact, it is so early that it suffers from heavy spring

frosts occasionally, to the detriment of the otherwise profuse crop of red, showy berries, which ripen in June. The Common Elder blooms during the summer and fall months, and its immense bunches of shiny black berries can often be seen, together with late flowers, at the same time and on the same bush.

Probably the most conspicuous and popular ornamental shrub when in fruit is the Wahoo, or Burning Bush. In fact, it is so attratcive that it is just as apt to be torn to pieces for its fruit as the Lilac bush for its flowers, by children or by thoughtless and ignorant grown-ups. The brilliant hue it attains in the fall is responsible for its name.

The Buffalo Berry also is of a striking appearance with its fine silvery foliage and its numerous small, orange-colored, edible, but rather acid, fruit. So is the Black Alder, Winterberry, or Deciduous Holly, with its load of orange red berries. Their flowers are inconspicuous.

Among shrubs that are handsome, both when in flower and in fruit, is the Hawthorn, or Thorn Apple, with its abundance of decorative fruit, which is mostly red; but a yellow fruited one is fairly common in this vicinity.

The Juneberry, with its snow white blossoms, silvery young foliage and edible fruit, blooms at the same time as some of our small flowering trees, like the Sand Cherry, Choke Cherry, Black Cherry, Pin Cherry and the Wild Plum. The Wild Crab is somewhat later.

Two of the best shrubs, comparatively little known, are the Black Choke Cherry and the Red Choke Cherry. They have very pretty flowers and red or black berries, respectively. Both would be worthy of the name "burning bush," with regard to their fall coloring.

Two summer flowering shrubs are the white flowering Meadowsweet and the pink flowering Hardhack, the latter being particularly desirable on account of its pink flowers, most of the wild shrubs blooming white.

A valuable shrub for general planting is the Prickly Ash, with its graceful shiny leaves and its spicy-smelling decorative seed. It is, next to the above mentioned Hawthorn, one of our best defensive hedge plants.

The common Staghorn Sumac, that lights up our countryside as with fire in the fall months, is too well known to need description.

Less known are the Hoptree, or Waferash, with big leathery leaves and curious bunches of seed, the False Indigo with its racemes of blue flowers and finely cut foliage, to be found along our lake shores, and the Button Bush, with its cream white flower buttons and its healthy, shiny leaves.

A shrub fairly hardy here, but not native any closer to us than Pennsylvania, is the White Fringe. It is so handsome that

High bush cranberry in blossom.

I will include it here, and thereby maybe boost its dissemination. Its foliage is broad and heavy, the whole plant closely resembling the Himalayan Lilac. Its flowers resemble wisps of finely cut pure white paper, and, also, its shiny dark blue fruit is very decorative.

Wherever there is room for any undergrowth in the woods, or in a neglected pasture, we find the Hazelnut, probably only conspicuous in its fall coat. The same is true of the Witchhazel, except that the latter is more interesting on account of its flowers appearing late in the fall and hanging on long after the leaves have dropped off, and its seed not ripening until the next season.

The Ninebark is a big, wide-spreading shrub with pinkish-white flowers and reddish bunches of seed. It is useful for all kinds of plantings where it may have lots of space to develop.

The Western Fly Honeysuckle and the American Bladdernut are two more shrubs that are not as plentiful in the trade as they deserve to be.

The shrubs mentioned so far are mostly tall growers, say from four to thirty feet, but the following few may be used where lower ones are needed:

The Snowberry; the Indian Currant, or Coral Berry; the Wolfsberry; the Scrubby Cinquefoil, showing its numerous bright yellow flowers all summer; the Wild Black Currant, and the Wild Gooseberry. The Wild Honeysuckle, with its small yellow flowers, to be found in the densest woods and also in open spaces, reaches a height of from twelve to eighteen inches only. Then, there is the Leadplant, for hot, gravely soil, and, last but not least, the New Jersey Tea, which lights up whole hillsides with its pale lilac-blue flowers. It will thrive anywhere and can stand to be mowed and burnt down every year with impunity.

Two shrubs that are really natives of Europe but have escaped cultivation, and are to be found growing wild here, can, on the strength of that, be used in wild plantings; the Common Barberry and the Buckthorn, both of them also making good hedge plants.

A few shrubby native vines are the Virginia Creeper; the Bittersweet, with white flowers and a profusion of orange colored berries; the Wild Clematis, or Virginbower; the glaucus Honeysuckle, the Catbriar and the Wild Grape.

We have here enumerated about fifty kinds of shrubs, a half dozen shrubby vines, and a half dozen small flowering trees, native to this and the surrounding states—to be sure, a goodly number to select from for a small planting and enough varieties for a big one, if they are all used.

Now, of course, with this I do not mean that horticultural shrubs or natives of other countries should not be planted. Far from it. They all have their uses, especially on city lawns and in city parks, but what I do mean to say is that shrubs like Hydrangea and Van Houttii Spiraea, planted along a woodland drive, would clash with their surroundings and look hopelessly out of place, while our native shrubs are appropriate anywhere and nowhere out of place.

Hotbeds and Cold Frames Nine Months in the Year.

N. A. RASMUSSEN, MARKET GARDENER, OSHKOSH, WIS.

I think that yesterday some may have got the impression that I was irrigating and watering for experimental purposes in connection with the University, but if you got that impression I want to change your minds. I am growing strawberries and gardening for profit, and the hotbeds and cold frames I am now going to speak about are part of the business in which I make a living. They are not run for pleasure, although it is a pleasure to do work of that kind, but primarily as a matter of profit. It is the same with the strawberries we spoke of yesterday. I water them because I noticed that I could get better crops by so doing. That is why I irrigate and not for experimental purposes or because I am connected with the University.

N. A. Rasmussen, market gardener and institute worker.

You have just been speaking about the high price of manure and the cost you are up against. We are paying about a dollar a load for manure besides the hauling, consequently we made up our minds we couldn't afford to run hotbeds only two months in the year but had to extend them over a longer period of time in order to pay for the expense and work we are putting on them. We make a practice of running them about nine months in the year. Another thing we had to do was to cut down the amount of manure we used. We used to have the beds on top of the ground entirely; we didn't care how much manure it took. We needed the manure for the garden anyway, and we didn't think the loss was so big, but now we dig down and use pits altogether. We take a common frame and set it on top of the ground and then dig down about a foot, using the dirt we dig up to bank with and protect it so that the wind will shoot over it. We make the frame higher on the north side, thus giving it a slant. We use the manure after it has been forked

over, filling within ten or twelve inches of the top, then adding four to six inches of dirt. What we don't need for plants we sow to radishes at the start, and these radishes will be out of the way at the time our lettuce plants are ready for transplanting. There is more money in growing lettuce than radishes, but we can get a crop of radishes off with no extra expense other than the seed.

We follow the lettuce with tomato plants, and practically all our muskmelons and cucumbers are started in the cold frames or hotbeds. We call them cold frames after we have taken out a crop of radishes and lettuce. They are all hotbeds to begin with. We take out the cucumbers and melons about the last days of May or the first of June—it may be about the 4th or 5th of June if the weather isn't favorable for planting before that time.

We then start with celery. All our celery plants are grown in the south part of the bed. We sow a row crosswise along the south side because we get a better stand of celery. At the time our cucumbers and melons are out our celery plants are ready to transplant. We put them about six to eight inches apart in the cold frames. We reserve one or two beds for head lettuce, as our trade demands some of this the entire summer. All we need to do with this celery after it is planted is to cultivate once or twice and water very frequently. We use a hoe with an extra long handle so we can stand up straight and not have to bend over. We cultivate it once or twice. All we need then is to water it. It takes a large amount of water but not as much as though it were out in the field.

A Member: How do you prevent rust?

Mr. Rasmussen: We haven't had as much rust in the frames as out in the field—or blight either. We take this precaution, we spray. We spray practically everything we grow, and every time we use bordeaux mixture for anything else we soak the celery, give it a good spraying, making the spray a little bit strong with blue vitriol.

A Member: How many dozen of celery plants do you put in a sash?

Mr. Rasmussen: Seven rows, four by nine, I think is what we get in a three by six sash. It depends somewhat on circumstances. The earlier ones we plant a little closer. We put an extra row in this season. There isn't much competition, and the trade will stand for that size of stock. A little later when celery is more plentiful we start out with one plant less, and we start with six rows. You have got to regulate that entirely by what your trade wants.

A Member: That will be six rows and six inches apart in each row?

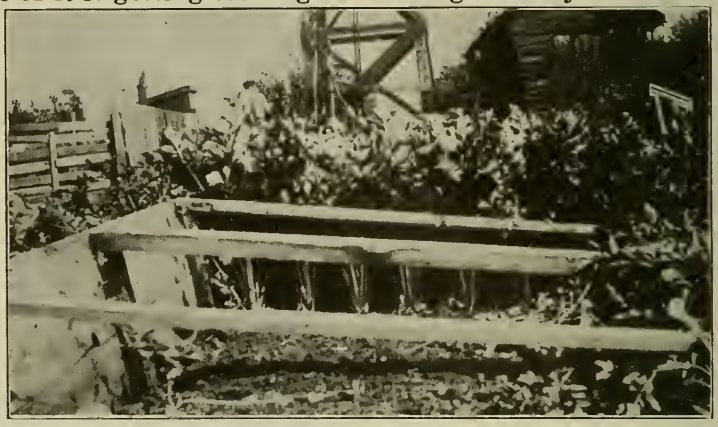
Mr. Rasmussen: I think we start the earlier ones with seven rows, the very first, and then drop down to six, and for real fancy we drop to five.

A Member: What variety do you raise?

Mr. Rasmussen: We grow mostly the White Plume and some of the Golden Self Blanching. After taking out the crop of lettuce we spade up the entire manure with the dirt, so it is about three-fourths manure and one-fourth dirt.

A Member: How long before celery is ready to cut after transplanting the last time?

Mr. Rasmussen: I think we get our first cuttings about the 1st of September. Well, some of it is earlier than that, say about the 20th of August. We sometimes hurry it along. If some of it is getting too large we let it go but try to hold it back



Celery growing in Mr. Rasmussen's hotbeds and cold frames.

as much as we can without injury. We sort our plants as we go along, using the first sash for the larger plants so as not to have them come on at the same time; we spread them over a period of time. One great advantage is that your celery is absolutely free from dirt grown in this way.

A Member: Doesn't your celery grow spindling when grown under cover?

Mr. Rasmussen: No, sir, we never cover it at all. When grown in this rich manure condition it is very easy to control the moisture. I think that is where you get away from the blight.

A Member: About how deep is your hotbed where the celery grows?

Mr. Rasmussen: Our frames are twelve inches on the south side and eighteen inches on the north side.

A Member: Then you spoke of digging out.

Mr. Rasmussen: Then we dig out about a foot. The frame is set flat on the ground and we dig out about a foot of dirt for the first sash we start for lettuce plants and tomatoes. We start probably the last of February. We have it more shallow after that.

A Member: In wet seasons don't your beds get too wet?

Mr. Rasmussen: No, sir, we are careful about the drainage and don't let the water settle on the plants.

A Member: What is your subsoil?

Mr. Rasmussen: A very heavy clay right where the beds are. There is gravel underneath, which makes a good under drain.

A Member: How about shade in these deep beds?

Mr. Rasmussen: They are really not deep. In the first place we bring the manure up within twelve inches of the glass. We let the bed slant a little bit with the slant of the glass and then we have about four to six inches of dirt.

A Member: Do you use the closed sash for the celery?

Mr. Rasmussen: Not very often. We do at first planting, of course, when we first set them, use the cloth sash. We have canvas sash we can handle easier, and we use them until the plants are well established and form their own shade.

A Member: How far apart do you transplant them?

Mr. Rasmussen: The first planting we hold about an inch and then reset from four to eight inches apart, according to the size of the stalk we want to get. We will follow the celery with radishes, which will come on about Thanksgiving.

A Member: Do you practice shearing the celery plants if they get too spindling?

Mr. Rasmussen: Not at any time, except when we are transplanting we cut them off sometimes.

A Member: Do you cut the roots as well as the tops?

Mr. Rasmussen: No, sir, we never do. I think they get broken off a good deal with the dirt. We do that sometimes without thinking of it, but we do not make a business of it.

A Member: What do you shade your plants with?

Mr. Rasmussen: If we use glass we put on a solution of air slaked lime but as a rule we use the canvas because they are lighter to handle; we use them all the time we are transplanting.

A Member: Wouldn't it be better for you to build concrete frames?

Mr. Rasmussen: I suppose we will have to come to it. I like the boards because they seem to hold off the cold more than the concrete would, but we will have to come to concrete.

A Member: Isn't it expensive to have to remove that manure before you put down new beds?

Mr. Rasmussen: We run our beds east and west in long rows, and we have room for a horse and wagon to go through. We had to get away from hand work.

A Member: Your land isn't as high as ours.

Mr. Rasmussen: You have to have space enough to pull your sash back and forth sometimes?

A Member: Yes.

Mr. Rasmussen: I think labor is getting as high priced as land.

A Member: Do you ever take up your hotbeds?

Mr. Rasmussen: Never take them up until they rot and we have to replace them. In the first place they were an eyesore, I didn't like the looks of them. But I found out I could use them longer, I found they paid for the labor.

A Member: Does celery grow tender after a frost?

Mr. Rasmussen: I don't know, we don't want the frost to catch it.

A Member: I generally let a couple of sharp frosts go by before I pick mine, and the tops will drop down.

Mr. Rasmussen: We are growing for the market, and they wouldn't want it in that condition. I don't think it is necessary to let it freeze.

A Member: How do you store your celery?

Mr. Rasmussen: We don't store any, for this reason. I never saw the time but what it would bring as much money in the fall as it would in the winter, at least, there is not enough difference to make up the loss.

A Member: Too much extra labor and too much waste when you store it?

Mr. Rasmussen: We can't afford to store it.

Mr. Baldwin: I am very much in favor of cement frames. I have them entirely on my place and have had them for years, and I wouldn't trade my frames for all the boards there are in the lumber yards of Minneapolis. I think anyone that would put them in would never go back to the wood frames. With the aid of shutters I can use mine all the year around.

Mr. Rasmussen: Do you not have trouble with the water running down and freezing?

Mr. Baldwin: I don't have any trouble with that at all.

A Member: Is celery more profitable than cucumbers?

Mr. Rasmussen: I think it is.

Mr. Baldwin: It depends on where you are. If you have got to pump water from a well 80 or 100 feet deep it will make some difference.

Mr. Rasmussen: My well is 240 feet deep; it is ninety feet down to water. I pump with a gasoline engine to an elevated tank.

A Member: Do you have any idea how much water you use?

Mr. Rasmussen: No, but I know it doesn't take much gasoline to run a horse and a half pump, and it doesn't take any more water to grow celery in hotbeds, don't think as much, as it does out in the open. We can't get good celery without watering outside. I think water is the cheapest plant food we have, even if we have to pump it from a deep well.

A Member: Do you find it necessary to shade your lettuce with burlap shades practically all the time?

Mr. Rasmussen: No. Of course, the head lettuce when we are growing it in July needs considerable shading, especially after a heavy rain when the sun comes out strong. We shade it, or it will start rotting.

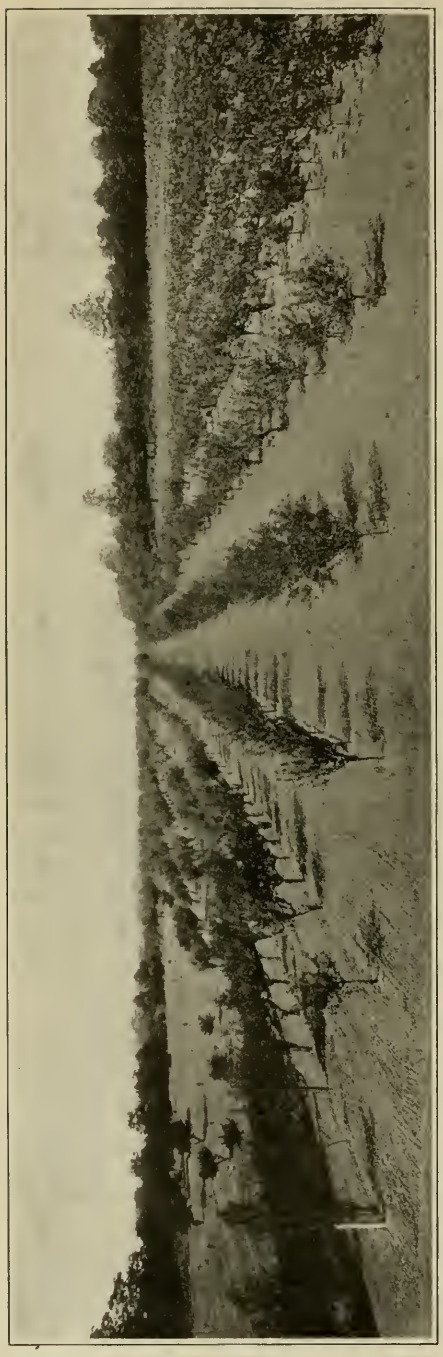
The Need of Fruit-Breeding.

PROF. S. A. BEACH, HORTICULTURIST, AMES, IOWA.

The late James J. Hill, some years ago, put out a statement regarding the prospective development of this country and the significance of land ownership, in which he included an estimate as to the increase in population in continental United States. It is a statement which I have often thought of and often quoted. Mr. Hill was a brainy, clear sighted man, and one who could see and appreciate things of fundamental importance. This statement regarding the prospective increase of population in continental United States was made some years ago. The fact that up to this date the prophecy has been fulfilled gives us all the more confidence in the reliability of this estimate for the future. The time set in this statement for the United States to pass the 100,000,000 mark was 1915. We actually passed the 100,000,000 mark in 1915. This estimate included the statement that by 1950 we should have 200,000,000 people in the United States.

Inevitably along with this increase in population is to go a corresponding increase in land values. Land and hunger is to increase. As we have frequently said in discussing this matter, it is important that we do not forget that while there is a crop of babies every year there is only one crop of land. The time has gone by when men can go out west and get good cheap land with which to compete with the farmers of this region. A generation or more ago the pioneers came in here to take up cheap land. Where do their sons go to get cheap land? They go into the arid or semi-arid regions to the westward, or they go away off into the Canadian Northwest. But even in the Canadian Northwest they have to pay a much higher price for land than the Minnesota pioneers paid when they came into this state. The day of cheap land has gone by. In meeting these conditions which we are beginning to face, and which our children must face, it is important that we provide for ourselves and put into the hands of our children the very best possible agricultural materials, so that we and they may be better able to succeed in the inevitable struggle which must be made with the rest of the world in order to maintain the type of civilization which we wish America to stand for.

We must more and more, I believe, meet strong competition as means of transportation are developed, new channels of trade are established and closer contact is made with all the world.



Experiment orchard grounds at Iowa Agricultural College, Ames, Iowa.

We must compete more and more with the six-cent a day labor of India and the very cheap labor of those other countries where it does not cost as much to live and to maintain churches and schools and all that goes with our type of civilization, as it does here in America.

And while we are making progress in farm management, in the development of farm machinery, in an understanding of the rotation of crops in a scientific way, in the use of fertilizers economically, we must also have, if we are to win this battle, the very best plant materials that scientific plant breeding can give us. We cannot afford to follow a hit or miss policy hoping to stumble upon the improved varieties of plants that are needed. On the contrary, we must go at it in the same scientific way in which Germany and the other countries have gone at the matter of preparing for this terrible conflict which is going on in Europe. We have another kind of conflict on. We must win. To win we must prepare for it by systematically planning to put into our hands and into the hands of our children the very

best plant material with which to produce the crops of grain, fruit and vegetables which are to maintain our agriculture and all of those other things which rest upon the foundation of our agriculture.

To be of greatest benefit to this region, the work must be done in this region.

One matter of importance, as I see it, and one reason why the work which you are doing is significant, is this: that the plant materials and particularly the fruit materials which you need to use here must be largely developed here; or if they are brought in from other regions they must be thoroughly tested here, for the purpose of showing to what extent they are adapted to this environment. Many varieties which are valuable and excellent in other countries or in other parts of this country cannot do well under our climatic conditions. Our best fruits in the future will be originated here.

Illustrating this point I wish to call your attention to the apple list for Minnesota and adjoining territory. I took the trouble just a few weeks ago to send out some circular letters of inquiry in the Mississippi Valley. I started out with the idea of including the territory from Lake Michigan to the Missouri River, but I didn't get the responses from Wisconsin that I desired. However, the responses which I did get represent, I think, pretty well the territory from Dubuque, Iowa, up the river to Minneapolis and then westward to the Missouri River. I took a few representative nurserymen in that region and asked them to give me a list of the kinds of trees that they have been propagating for the past five years, which in a general way, I take it, means the kind that people here are planting most. Possibly some of the kinds which show up now in small numbers may later develop to greater importance. Doubtless newer kinds have not yet come to their full recognition.

Imagine, if you can, the apple trees in this entire region which have been planted during the last five years combined into one orchard a thousand miles long. The reports from these nurserymen as to what they have been propagating indicate that in this thousand miles of apple orchard the varieties would stand about as follows:

220 miles of Wealthy; 118 miles, Duchess of Oldenburg; 117 miles, Northwestern Greening; 93 miles, Patten Greening; 69 miles, Hibernal; 40 miles, Okabena; 39 miles, Malinda; 35

miles, Anisim; 26 miles, Yellow Transparent; 22 miles, Longfield; 21 miles, Iowa Beauty; 20 miles, Jewell Winter; 19 miles, McIntosh; 19 miles, Wolf River; 142 miles other scattering varieties in smaller numbers. Total, 1,000 miles.

Examine the above list as to the origin of the varieties named. With practically but one exception they have either originated in the region extending from Lake Michigan westward to the Missouri River, or they are Russians.

First on the list is Wealthy, which I believe to be a cross between some red Siberian crab apple and the Rambo. Look at its basin and note the resemblance in color markings and in form to the Rambo. I suggest that Mr. Elmer Reeves, who is here, be asked to make a statement of what he knows about the real origin of the Wealthy that you may place it on record in the report of this society as a correction of the old statement that it was grown from seed brought from Maine.

At any rate, whatever its parentage, the Wealthy originated from seed sown by Peter M. Gideon at his home in Excelsior, near Minneapolis.

Northwestern Greening, the next on the list, originated in Waupaca county, Wisconsin.

Patten Greening, the next, is from Duchess of Oldenburg and originated at Charles City, Iowa, by Mr. C. G. Patten, whom I am glad to see here with us today.

Hibernal is a Russian.

Okabena originated here in Minnesota from seed of Duchess of Oldenburg.

Malinda was brought as a little seedling tree from northern Vermont to Minnesota, where it was first introduced into cultivation.

Anisim is a Russian, as also are the next two on the list, Yellow Transparent and Longfield.

Iowa Beauty originated with Mr. C. G. Patten, in northern Iowa. What is its parentage, Mr. Patten?

Mr. Charles G. Patten: The Golden Russet.

Mr. Beach: Jewell Winter originated in north central Iowa; McIntosh originated in Canada. Wolf River should be classed with the Russians; it originated in Wisconsin. Evidently it is a seedling of the Russian apple Alexander.

Out of this list of fourteen best apples for this region, five were imported from Russia and the others, excepting McIntosh, were developed here, and most of them have the blood of Siberian

crabs or Russian apples, if apples can be said to have blood lines of descent.

The point I am trying to make is that of all the varieties which we now have those which are best for Minnesota are kinds which either have been introduced from Russia or which have been developed here, and the best of them have been developed here.

We must do right here the fruit-breeding work which is to benefit us. We must develop our improved varieties here, out of the plant materials already here and any others which we can gather through the help of Professor Hansen and such other explorers from any part of the earth where good and useful plant material may be found. It is on this improved material that we are to build our most successful horticulture in the future. How is this to be done?

Methods of Improving Plants.—The lines along which plant breeding can be developed are indicated by the methods used in propagating plants. We know that propagation of plants is either by sexual or by asexual methods. Take the apple for illustration. We have propagation from seed. This may represent either one or two parent varieties. Then there is propagation by means of budding or grafting, which signifies the perpetuation of that particular variety by division into separate parts; it is simply a continuation of the original individual from which the buds or scions were taken. And so, although apple varieties do not come true from seed, we may multiply the trees of any variety indefinitely by propagating its buds or cions.

Again we have the development of new types from seed as the result of hybridizing, i. e., crossing the parents to produce the seed.

Very seldom do we have—but we may have—the origination of new varieties asexually as graft hybrids. In other words, there is such a thing as a graft hybrid, although just what its nature is botanists have not decided.

Finally, we may have a new variety originating as a sport. For example: I have in mind a Concord grape vine on one side of which came out a branch which bore fruit almost twice as big as the ordinary Concord, a giant Concord, so to speak. When the giant Concord clusters were self-fertilized and the seed propagated it gave us a distinct line of seedlings as compared with the seedlings grown from the normal type of Concord produced by the other side of the same vine. Here was a new variety that

originated as a bud sport. It came originally from a bud on one side of that Concord vine which grew into the cane that bore the giant Concord fruit. Something had so fundamentally changed the nature of that original bud as to affect not only it, and the cane which grew from it, but also the seed which the giant Concord produced.

Not only may we have the development of new varieties as bud sports, they may come also as seed sports. For example: we may get a smooth skinned peach, which we call the nectarine, originating from the pit of a peach. This is a case of a sport originating from the seed.

Finally we may have new varieties originating as selected strains, either from seed selection or bud selection. By a long process of gradual selection and change a new variety may be developed in this way. For example, some lettuce growers of Rochester, New York, starting with Henderson's Gold Ball lettuce, after many years produced a selected strain which was somewhat different from the original type with which they started. Through a series of generations extending for over twenty years they developed a lettuce gradually by selection towards the type which they wanted. At the end of that time they had a variety which was distinct enough from the old Henderson Gold Ball so you could properly call it a distinct strain.

So, also we may develop selected strains asexually, as for example, strains of violets, Madam Salleroi geraniums or, perhaps, of potatoes, or of other plants which are propagated by division of parts. Selecting the propagating material, buds or scions or cuttings, or whatever it may be, through a succession of asexual generations, we may thus sometimes succeed in developing something different from the original type, which may be called an improved strain.

The Work Should Have State Aid.—We must study scientifically these processes of reproduction and origination of improved types in order to make the greatest progress. The work which men like Mr. Patten is doing is a splendid type of work. It is the kind of work that ought to be perpetuated. Mr. Patten has but the life of an ordinary man in which to do his work; the state is perpetual; it will live on year after year, generation after generation. We expect that centuries from now the people of Minnesota will be growing apples and grapes and other good things here in this region long after we and our children's children have passed away and have been forgotten. It certainly

is the wisest kind of statesmanship to provide most liberally for the support of this kind of work by the state, on land owned by the state and by state employed specialists who have had the best training, thorough experience and thorough scientific study that they can receive. The splendid work of individual effort has accomplished much—these remarks are in no sense to be construed as a disparagement of such work—but the state can perpetuate the effort in a way the individual cannot do.

In this rather rambling discussion I have tried to show these things:

1. The need of fruit-breeding work for Minnesota and for this whole region from Lake Michigan westward into the semi-arid districts of this great central plain.

2. The greatest advance in securing new and improved plants for this region must come through work done in this region. In order to get the "survival of the fittest" the plants must be developed and tested under the climatic conditions which exist here.

3. Scientific methods must be followed systematically and persistently in order to achieve the highest degree of success in fruit-breeding for Minnesota.

4. In addition to the work of individuals and horticultural organizations, state aid is needed to secure most efficient progress and permanent success.

I wish in closing to commend most heartily the fruit-breeding work which Minnesota is doing, a work which, I believe, has been accomplished largely on the initiative and by the support of this splendid society. The society is doing a good thing for this state and the adjoining regions in helping to put fruit-breeding work upon a sound and permanent foundation, establishing and supporting it so that it may make most permanent and most efficient contributions to the progress of horticulture in this splendid agricultural region.

Mr. G. C. Hawkins: I would like to ask, what is this theory in regard to sports. I am in floral work. We have a bed of yellow and brown gaillardia, and out of this I have a sport, one plant that is pink and white, distinctly pink and white, from the same brown and yellow. I would like to know your theory about this.

Mr. S. A. Beach: I may say that we have more than one kind of sports. That is to say, we have a sport which may affect simply what we call the body of the plant, so that it shows increased growth or different color or shape or size, or something of that kind. Is that change to be permanent or not? We don't

know. We put it to the test. We propagate it. If it holds true under sexual propagation then we call it a mutation, that is the scientific word for a permanent sport. Whether what you have is an ordinary sport affecting the body of the plant only or whether it is a more deep-seated change which will affect the sexual reproduction and can be reproduced from seed, in other words, whether it is a mutation or not, can be told only from the subsequent history of its pure bred seedlings. What it is that causes that mutation we do not know. For instance: there has been some scientific work done along that line by Dr. MacDougall of the Carnegie Desert Laboratory, Tucson, Arizona. Dr. MacDougall injected some weak solutions of certain chemicals into the seed cavities of certain plants, at the time when the ovules were being fertilized from the pollen tubes. The result was that he got some mutations. He got certain changes, and those changes perpetuated themselves by seed. However, he couldn't tell beforehand what changes he was going to get. All he knows is that he did, by putting in certain disturbing factors, cause changes to occur in the seed and in the plants grown from such seed. Just what it is that has acted as a disturbing factor in changing the colors of these flowers you mention we don't know.

Mr. Arrowood: We had a hollyhock that grew up so high (indicating) and the center was of a light yellow. All the sprouts around it from the ground up bore black flowers. There were ten of them, and every one had black flowers and the center was yellow. If you can explain that I would like you to.

Mr. S. A. Beach: That is of the same nature as where you find a certain branch coming out from a peach tree, growing out of a bud, of course, in which a change has taken place in the bud. As that branch comes out and bears fruit you may find that it bears nectarines, and the other branches bear the ordinary peaches. In other words, what you have there is a bud sport. We can't tell what caused it.

Mr. Arrowood: If we save seed from this plant next year, will it produce the same thing or will they be different?

Mr. S. A. Beach: That can be determined by testing. Care must be taken to make the test sure. You must be sure that the flower is protected from any outside pollen. In other words, it must be self-fertilized. Then plant the seed, and it may reproduce this new type. If it does, you have what we call a mutation. The only way I know of to determine that is by actual trial.

Mr. Kellogg: I wish to object to the Wolf River being called a Russian. There may be a little Alexander blood in it, but it has more of the Wisconsin blood in it than Russian. (Applause).

Mr. S. A. Beach: I stand corrected, but it establishes a point I wish to make, that the variety was developed in this region.

Professor N. E. Hansen: It is a seedling of the Alexander, which was named after Emperor Alexander of Russia.

Grand Rapids Trial Station in 1916.

OTTO I. BERGH, SUPT.

The variety test of bush and tree fruits at this station has been enlarged considerably the past year. The plantings were made the latter part of May, as soon as the frost had gone out of the ground sufficiently. The cool and wet weather through June was exceedingly favorable for starting a new plantation, and the new stock made an exceptionally good growth and is going into the coming winter in fine condition. A very low

Residence of superintendent at Grand Rapids Trial Station.

percentage of the new plantations died during the summer where the stock was received in good order.

The new plantations include the following fruits:

Grapes.—Campbell's Early, Alpha, Hungarian, Dakota, Suelter and Worden's Early. All of these made fair growth, and in the case of Campbell's Early there were vines producing as many as four bunches of fruit.

Raspberries.—Herbert, Minn. 30, Minn. 31, Shipper's Pride, Golden Queen, Marlboro, Worthy, Shaffer, King, St. Regis, Cuthbert, Miller, Minnetonka Ironclad, Sunbeam, Gregg and Columbian. All of the above varieties made a very good growth and produced considerable fruit during August and early September.

Blackberries.—Wilson Early, Snyder, Stone Hardy, Eldorado, Early Harvest, Blower, Watt, Erie, Iceberg, Ward, Mersereau, Kittatining and Ancient Britain. The most of these

varieties made exceptionally sturdy growths, some vines exceeding six feet in length, a few of which produced ripe fruit.

Dewberries.—Premo, Lucretia and Austin, all of which made a good growth and bore some fruit, which ripened the latter part of August.

Gooseberries.—Red Jacket, Champion, Downing, Houghton, Keepsake, Portage and Josselyn. Compared with other bush fruits the gooseberries made the least growth; however, in a few instances fruit was produced. The berries were of exceptionally large size.

Spring in the air at Grand Rapids Trial Station.

Currants. — Victoria, North Star, Lee Prolific, White Grape, Red Dutch, Long Bunch Holland, Wilder and Black Champion. In most cases these made satisfactory growth.

Strawberries.—A few plants of the following strawberries were included in our variety test this year: Bederwood, Brandywine, Chesapeake, Clyde, Enhance, Enormous, Early Ozark, Haverland, Lovett, Senator Dunlap, Marshall, Sample, Wm. Belt, Wolverton and Warfield. This stock was in poor condition when planted; however, where the stock was in good condition the results were very encouraging.

Tree Fruits.—A new orchard of tree fruits was set out this year in a more exposed location, which will afford better soil and air drainage than there was in the location of the old orchard. The new orchard is located on a hill west of the station buildings. This change was made in order to safeguard the new plantation against blight and other diseases which have almost destroyed the old orchard. The soil condition in the old orchard is also very poor in that there is considerable seepage from the hillside where it is located, which we believe is the main cause of a lack of success in the past in growing tree fruits at this station.

The new orchard includes the following fruits:

Variety.	No. trees.	No. in poor condition when planted.	Condition at beginning of winter. Weak.	Dead.
Plums.				
Cheresota	12	0	0	0
Opata	12	5	1	2
Hanska	12	1	3	2
Sapa	12	2	0	0
San Soto	12	0	0	0
Egama	12	0	0	0
Toka	12	0	0	0
Kahinta	12	0	0	1
Wachampa	3	0	0	0
Etopa	12	4	1	1
Surprise	5	1	0	0
Zekanta	13	1	0	2
Yutteca	12	0	2	0
Wyant	11	1	0	1
Terry	12	0	0	0
Topa	13	5	1	2
Wastessa	12	4	7	1
Compass Cherry	12	0	0	0
Apples.				
Wealthy	13	0	1	1
Duchess	12	4	0	0
Jewell Winter	12	0	2	0
Hibernal	10	0	0	0
Malinda	12	6	1	0
Charlamoff	14	4	0	0
Delicious	13	5	0	0
King David	12	6	1	3
Crab Apples.				
Whitney	12	0	0	1
Early Strawberry	12	4	0	2
Sweet Russet	12	1	0	0

University Seedling Apples.

Minnesota.—No. 36, 1 tree; No. 100, 1 tree; No. 79, 1 tree; No. A-1, 1 tree; No. 81, 1 tree; No. 269, 1 tree; No. 104, 1 tree; No. 82, 1 tree; No. 20, 1 tree; No. 20-G, 1 tree; No. ?, 4 trees; No. 132, 1 tree; No. 272, 1 tree; No. 135, 1 tree; Malinda, No. 29, 2 trees; No. 3, 2 trees; No. 38, 2 trees; No. 12, 1 tree; No. 32, 1 tree; No. 7, 1 tree; No. 12, 1 tree; No. 35, 1 tree; No. 17, 1 tree; No. 18, 1 tree; No. 13, 1 tree; Gilbert Winesap, 1 tree.

The total number of trees planted was 369, of which fifty-nine were in poor condition when planted, either from dry roots, dry tops or both. Three hundred and fifty lived throughout the season, twenty-one made a weak growth, and nineteen died during the summer, leaving 329 out of 369 trees to go into the winter in good condition.

Paynesville Trial Station in 1916.

FRANK BROWN, SUPT.

I am much afraid that this report will not be as optimistic as some of the preceding reports have been, as fruit was so nearly a failure in central Minnesota.

One thing has been again demonstrated to the people of this section, and that is, we cannot grow apples without spraying, that is, no apples fit for market.

Top-worked trees bore more fruit and better fruit than the trees handled in the ordinary way, a dollars and cents demonstration that it pays to top-work, at least a part of the trees in the home orchard.

Plums, except a few varieties, were a total failure; the Hansen hybrids were beautiful, especially the Opata and Sapa, and the quality of course was excellent.

Of the plum trees sent here from the Central Station, were two trees of No. 12 that this year bore for the first time. The fruit was of the very best and the trees heavily loaded. We shall watch these trees very carefully in their future development. We might add that they are very thrifty.

No. 21 also bore some very fine specimens of fruit, with a very decided apricot flavor, but so far it has been a tardy bearer with us.

Of the raspberries sent to this station, No. 4 has won the way to the front rank. It is a large berry, very firm, making it good for shipping. It separates easily from the stem, seems to be hardy, and the quality of the fruit is good enough for anyone.

Minnesota No. 3 strawberry is still at the head of all the June bearing berries. Not only is the plant healthy and strong, and the fruit well up from the ground on long stems, but the fruit is all that could be desired in a strawberry. It is firm and a good shipper; it is a large berry, some of the best specimens measuring one and three-fourths inches in diameter and ripe to the center, with no green tip, as the Senator Dunlap has. Under the auspices of your superintendent it has been tested on various soils, and in different localities, and so far has the unqualified approval of all.

The plants and trees sent here from the Central Station the spring of 1916 all lived and made a good growth. The raspberries, Nos. 30 and 31, supposed to be of everbearing habits, grew very well; No. 31 bore a few berries of a fair quality. This

number has a strong cane and good foliage, but of course the first season is a small test.

I have neglected to speak of the everbearing strawberry No. 1017. It is one of the best plant makers of the everbearers, and the fruit is fine, but this last season it did not produce as much fruit as the Progressive. I think it worthy of further trial.

Fruit buds have ripened up in good shape, and in that respect the outlook is good, but the ground is freezing up so dry that there is much danger of root-killing, a fact that we had all better take notice of ere it is too late.

Annual Report, 1916, Vice-President, Fourth Congressional District.

B. WALLNER, JR., 200 DODD ROAD, WEST ST. PAUL.

The Fourth District cannot boast of any extraordinary horticultural feat this year.

The yield of small fruits was fair considering the adverse conditions caused by the severe drought in the latter part of the season. The apple crop was good notwithstanding the fact that the weather was far from favorable. The plum crop was almost a complete failure. I attribute this to the cold, wet weather during pollinization period. Grapes were fine, an abundant crop was gathered in our immediate vicinity.

I specialize mostly in small fruits; currants constitute my main crop. The yield was not as abundant as usual, but the berries were of exceptionally fine quality. I enclose report in detail.

Apples.—Average 70% 1916, good 1917.

Plums.—Average 5% 1916, good 1917.

Cherries.—No crop.

Grapes.—Average 85% 1916, good 1917.

Blackberries.—Average 5% 1916, good 1917.

Raspberries.—Average 85% 1916; drought reduced size of fruit at end of season; good 1917.

Strawberries.—June bearing 85% to 90%, Everbearing 20% 1916 and fair 1917. Poor plant stand in unfavorable location.

Other fruits.—Currants 80%; gooseberries 90% 1916, good 1917.

About normal planting of nursery stock. Suffered to some extent from drought towards end of season.

Slight amount of blight. Cut it out.

Most of the large commercial orchards were sprayed with good results.

Plum fruit buds were badly injured 1916. All plum varieties affected. Soil condition good 1915; foliage hung on late in 1915.

Soil now very dry. Fruits went into winter last fall in fair condition.

Lists of varieties of fruits of all kinds doing best in our locality: *Apple.*—Wealthy, Duchess, Patten Greening, Northwestern Greening, Florence and Strawberry crabs, Okabena. *Plums.*—De Soto, Forest Garden, Surprise. *Grapes.*—Beta, Brighton, Concord, Campbell Early, Delaware. *Raspberries.*—F. B. Farm No. 4, King, Cuthbert, Miller, Minnetonka Iron Clad. *Currants.*—Wilder, Victoria. *Gooseberries.*—Pearl, Downing. *Strawberries.*—Senator Dunlap, Bederwood, Warfield, Clyde. *Everbearing.*—Progressive and Superb. High bush cranberry.

The results of this season prove that we should not specialize on one crop.

Have a Garden This Year.—That the majority of people have overlooked or forgotten the value of gardens in recent years is indicated by the slowness with which the idea of vacant lot and back-yard gardening in cities has sprung since the rapid rise in the prices of food products. Vegetables and especially canned goods are unusually high in price and gardens will do more than ever before to cut down the cost of living. Properly cared for, the small plot or garden will supply enough vegetables for the average family. Good seed, proper cultural methods, plant food, either in the form of manure or fertilizers and a few garden tools are all that are needed to make a start in the gardening industry for home use.

Essentials of Growing Good Vegetables.—Nothing is more important in growing good vegetables than to have a fairly rich soil with which to work. The soil that does not need enriching to produce at its best is seldom found, and success comes proportionately to the amount of fertilizers and manures that is applied when all other factors are given efficient attention. Make the soil rich, prepare the seed bed properly, use good seed, keep down the weeds and supplement the natural supply of rainfall with sprinkling when necessary to secure good vegetables during the coming season.

Annual Report, 1916, Vice-President, First Congressional District.

C. E. SNYDER, PRESTON.

The apple crop was light through the First District. It was an off year. Where trees were sprayed the apples were good and smooth, where not sprayed they were scabby. There was no blight nor much of any other disease than scab. About enough was raised for the local demand. No carloads shipped from this district this year to my knowledge.

A well shaded residence street at Preston.

Plums were a light crop generally but of good quality. Cherries none to speak of except Compass. Raspberries about one-half crop except in a few localities where the crop was fine. Strawberries, June sorts, were less than half crop owing to winter injury most everywhere. New set beds of Progressive gave good returns all fall. Currants a fair crop and gooseberries a great big crop. Grapes not many.

Considerable nursery stock was planted this spring and results are good. Not so many apple trees as formerly, but heavy planting of small fruits and ornamental shrubbery of all kinds. A great impetus to landscaping and ornamental tree, shrub, rose and flower planting is going on here.

Fruit trees and all other fruits are going into winter in tip top condition, well ripened and plenty of moisture. The growth was not rank but good and solid.

The fruit list adopted by the state is all right except there are more varieties we can grow here in this favored corner. We like the Malinda and believe it belongs in the first degree. Many trees in this district over thirty years old and as good as ever. It is surely as hardy as Okabena and not subject to blight. Northwestern Greening is mentioned favorably in all the reports to me. It is all right down here. Delicious I have been growing from root grafts for about eight years, and after last winter think it no hardier than Ben Davis, Fameuse or Golden Russet. Salome is about as hardy as the Wealthy. Patten Greening is in

The Root River at Preston, delightful parking opportunity. Is it being improved?

demand when men from the south want apples. It is such a great pie and sauce apple, the tree is so dependable, such a young and prolific bearer of big apples. When the buyer from St. Louis came here last year he asked for one hundred or two hundred carloads of "those Patten Greenings." Commercially it belongs right beside the Duchess and Wealthy and will turn out more carloads than either of the very best dessert apples in existence.

A summary of the reports put to the top Carrie gooseberry, Perfection currant, King and Older raspberries, Dunlap and Warfield strawberries; Progressive, fall bearing; De Soto, Wyant, Stoddard and Hansen plums, Concord and Worden grapes. In roses the hybrid Rugosas are in favor, being free bloomers all

summer and not much if any winter protection needed. The little hedge plant, Berberry Thunbergi, is in great favor, also Hydrangea Arborescens and Spirea Anthony Waterer and Van Houttii.

Quite a number here spray their orchards, and it will soon become general, as the results are so manifest. Buyers look up those orchards first. The lesson has begun to sink in. We need vinegar, cider or evaporating factories to use up the cull apples. All the large growers deplore this waste. Spray or no spray, there are bound to be off-fallings caused by wind, drouth, neglect or something. There is a new everbearing raspberry down here, that we call Gilbertson, that surpasses anything else in the raspberry line in size, productiveness, also of good quality and about as hardy as King. Wherever we observed them this season they were loaded with great fruit all the fall, from plants set this spring.

Co-operative Methods Not a Cure-All.—"Fruit growers in the east have long looked upon the great fruit growers' organizations of the Pacific Coast States as being almost models of all that fruit growers' organizations should be. The thorough manner in which they have safeguarded every step from the pruning and spraying of their trees and the thinning of the fruit to the packing of the product in neat, attractive packages, just so many apples, uniform in size and color, to the box, has been pointed out as the explanation of their ability to outsell—not undersell—eastern fruit in the eastern markets. It has come as somewhat of a shock, therefore, to many eastern growers to find that in spite of their apparent perfection of method, all things are not well with the fruit growers of the western coast states. In fact, it has seemed at times as if their situation could hardly be worse. The very prosperity brought about by their early successes has led, in a large measure, to their undoing. This success created a false optimism, which resulted in over plantings, excessive land values, increased cost of production, and ruinous competition between different co-operative organizations. This condition, in turn, culminated in glutted markets, and such low prices for fruit that thousands of fruit growers have been ruined and large areas of fruit trees cut down and the land devoted to other crops."—Canadian Horticulturist.

Universal Fertility Service.—How about starting universal fertility service? All boys on the farm, and all men, too, are eligible to join. The requirements are that you do your share toward maintaining the fertility of the soil and promote agricultural preparedness by using the best methods of handling your soils and crops. Your experiment stations and agricultural colleges will furnish soil fertility ammunition in booklets and pamphlets. Bigger production is needed and to secure it better methods of farming are urgent.

Samuel Cooper, Founder of American Race of Everbearing Strawberries.

CHAS F. GARDNER, OSAGE, IOWA.

We are sure the members of our society will be pleased to see the portrait of this man, who is the founder of the American race of fall bearing strawberries. He is now eighty years old and is spending the winter in Florida (February 19, 1917). He will be back home April 1. He had the misfortune to lose his wife, who died last June. His daughter is with him at Eau Gallie, Fla., taking care of him. He has been more or less under the doctor's care for over a year, but now seems to be improving.

Samuel Cooper, now in his 81st year.

His first discovery was in the autumn of 1898, when he found growing in the row of Bismarck plants, set the previous spring, a plant that had made sixteen runner plants, all of which had either ripe or green fruit or blossoms on them. The old plant was heavily laden with fruit. The first public exhibit of this fruit was at Buffalo, N. Y., at the Pan-American Exposition. He called his first variety "Pan-American." See Iowa State Horticultural Report, Vol. 45, 1910, page 274.

With this start he commenced to grow seedlings by crossing the best varieties and making selections. In this way he produced the Cooper, a very valuable variety for crossing but not an everbearer. The following named seedlings were all fall bearers: Autumn, Onward, Forward, Advance, Superb, Peerless and Productive.

Twelve years ago or more several experienced horticulturists took up the work by purchasing plants of Mr. Cooper and making judicious crosses and selections, until now there are perhaps 100 valuable varieties on hand which will be found worthy of culture.

All the varieties that I have heard of, or seen, which have any value whatever for this latitude can be traced back to some of Mr. Cooper's plants. We hope he may recover his health and live many years yet, to enjoy the great benefits which are accruing from his wonderful discoveries.

Story of the Origin of the Wealthy Apple.

E. M. REEVES, WAVERLY, IOWA.

I am glad to tell you the story, if you desire it. I do not wish to upset any cherished ideas you have in regard to the Wealthy, the one most prominent apple, I believe, of the whole list. Take it the whole world over, I don't know of another apple that is as prominent and favored in so many places.

We all know that Peter Gideon had some peculiarities. We all have them, and it is our peculiarities that get us into trouble sometimes, and sometimes they make us prominent. Mr. Gideon had his peculiarities, and one of them was that when he was going to do anything of any moment he consulted the spirits, and they guided him in whatever he was going to do. The general idea is that he consulted the spirits and sent down to one of the states in New England and got a small quantity of crab apple seeds and planted them, and from that planting grew the Wealthy. It will take a few moments for me to tell the story, and then I will tell you what I believe, and I have good reason for the belief I have.

When I was about eleven years old a cousin of mine moved from Excelsior, Minnesota, to Waverly, near my home, and I was with him a good deal from that time on. He was a young man, and he had homesteaded near Excelsior and had worked for Mr. Gideon at various times, and he lived in his family and worked for him at the time Mr. Gideon obtained the seed from which the Wealthy was grown. He helped plant the seed and cared for the little trees during the first summer of their growth. In the fall he helped Mr. Gideon take up the row of seedlings that he had grown, and they buried them for the winter. The next spring he helped Mr. Gideon again in the planting of those little seedlings.

One little incident he tells concerning the matter is that this Wealthy tree had a little branch or sprout that grew close to the ground, or just barely under the ground, and had formed a little sort of root on the lower end. Mr. Gideon cut off that branch and stuck it in a potato with the idea of making another Wealthy tree. He had not named the tree yet, but he was going to have two trees of the same sort, but this second tree was destroyed. This cousin told me the entire story of the origin of the Wealthy apple at the time that he moved to Waverly and insisted upon the facts, but we thought very little of it then.

A few years later Peter Gideon attended a meeting of the Northern Horticultural Society of Iowa at Hampton; that was the winter of 1885, about. I could not be sure of the date without consulting the reports. On the way over to the train I picked out Mr. Gideon from having seen his picture and got into conversation with him at the depot. I tell this so you will understand some of the circumstances that followed. At the depot where we got off the train at Hampton there was snow on the platform, ice and snow from the platform down to the rail track. Mr. Gideon missed his big buckskin mittens after he got off the train and got back on the car to get them. He had to hurry and the train started before he stepped off, and as he stepped off onto the platform, being somewhat old then, the platform took his feet from under him, and he started to roll under the train. I was young and active, and I reached down with both hands, got hold of his overcoat and pulled him back safely out of reach of the wheels.

Afterwards, realizing the danger he had been in and his narrow escape, he seemed to attach himself to me, and we were together most of the three days of the meeting. We took a room together at the hotel and lying in beds that were close together we talked most all night. You know, I realized the importance of Peter Gideon's work, and I was glad to talk with a man who had done as great a work as Peter Gideon had in giving us the Wealthy apple.

It was a wonderful thing for me to talk to Peter Gideon, just as it should be a wonderful thing for us to talk with any of these men who wear the bronze buttons. In a few years we won't have the chance any more. During the course of our consersation I asked Mr. Gideon about the origin of the Wealthy. "Well," he said, "I will tell you the real story of that." He said: "I haven't told people right about that." I asked him why, and he said it was none of their business anyway. So he told me this story:

His wife's father, Mr. Hall, lived in Illinois and planted an orchard entirely of Rambo apples, nothing else in the orchard. Then a few of the trees died, and he planted a large red crab apple, presumably the Hyslop. Many of us know the Rambo apple, and I think we all know the Hyslop crab. When these crabs got to bearing and the Rambo also were bearing, Mr. Hall sent a small box—I think it was a small chalk box—filled with

these crabapples and wrote to Mr. Gideon to plant the seeds of those crabapples to see if he could not grow something that would bear fruit in the cold climate of Minnesota. Mr. Gideon saved the seeds from those crabapples himself, kept them until spring and planted them. This cousin of mine helped him with this work, with the planting and care of them, and it was from that planting that he grew the Wealthy apple.

Mr. Gideon told me this and insisted upon its being the fact, and it looks very plausible to me. I believe it fully. After going home from Hampton I went to my cousin and asked him again to tell me the story of the origin of the Wealthy, and he repeated it. At that time I was perhaps thirty years of age, or near that, and he told me the same story that he had told when I was a small boy without my prompting him or in any way interfering with his narrative.

So, friends, I fully believe that that is the real origin. You take a quantity of the Wealthy apples and compare them with the Rambo apples, as I had a chance to do at a meeting three weeks ago, and you will see a strong resemblance between the Rambo and the Wealthy. If you take some of the Wealthy trees where they are not growing the most vigorous, you will find some apples that have a crispness and the inside coloring like you often get in the Hyslop crabapple. Then also the seedlings from the Wealthy indicate somewhat its origin. Take it altogether I believe that that is the real history of the Wealthy.

Mr. Philips: You claim that the Wealthy is a seedling of the Hyslop fertilized with the Rambo apple?

Mr. Reeves: That was Mr. Gideon's story.

Mr. Philips: That does not hurt the Wealthy any.

Mr. Reeves: It does not hurt the Wealthy a bit—not a bit. The Rambo is a good apple; it is a mighty good apple.

Mr. Philips: I used to eat it sometimes when I was a boy.

Prof. Beach: Did Mr. Gideon say that that was the Hyslop crabapple that the seeds came from?

Mr. Reeves: He didn't seem to be sure, but he thought it was. As to its being the Hyslop he was not sure, but it was a large red crabapple.

Prof. Hansen: Is that orchard there yet? What part of Illinois?

Mr. Reeves: This was a long time ago. I have no knowledge of it, but I presume it is not there any more.

Prof. Hansen: Somewhere in southern Illinois?

Mr. Reeves. I could not tell you. (Applause).

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So. Minneapolis.

Seed distribution.—At the meeting to be held in the Public Library, Minneapolis, April 13th, our trial seeds will be given out. As fine seeds are very high and hard to get, it will be necessary to limit the distribution of these to our members, so please bring your 1917 membership cards with you that day. Seeds will be given out from 1:30 to 2:30, and will be given on new memberships or renewals made on that day also.

Plant exchange.—Send lists of plants you have to exchange and those you wish, to our Secretary, Mrs. Countryman, 213 So. Avon St., St. Paul, at once. The lists will be posted at the April meeting, and exchanges can be arranged for between members. The May meeting will be regular exchange day, but if you have any to exchange the lists should be sent *at once.*

NOTES ON MR. NESOM'S TALK ON " LIME IN THE GARDEN.

An acid soil is one in which there is a deficiency of lime. Sandy and peat soils are most apt to be acid. Apply a slip of blue litmus paper to damp soil. If the paper turns pink the soil is acid and needs lime.

In every ton of hard wood ashes there are from 600 to 1,000 pounds of lime and from 40 to 60 pounds of potash.

Crushed limestone is the most common form of lime applied to the soil. As it is slow in acting, it should be applied, if possible, in the fall at the rate of five pounds to ten pounds to every five square yards. This costs about two dollars a ton. Quick lime is faster in action and also more concentrated, one pound of the quick lime being equivalent to two of limestone. It is better to use in the spring than the limestone. It should be raked into the soil early in the spring so that the rains may carry it down.

Experiments have been made with lime in the home garden. Of fruits, currants, Cuthbert raspberries and strawberries were improved by the use of it; black cap raspberries, blackberries and cranberries were injured by it. Nearly all vegetables were improved by its use, those most benefited being asparagus, beets, celery, lettuce, onions, parsnips, peppers and salsify.

The flowers most improved by lime were sweet alyssum, candytuft, poppies and mignonette; those improved but in lesser degree were foxgloves, goatsrue, balsams, nasturtiums, columbines, gysophila and sunflowers. Flowers that preferred acid soil and were injured by lime were indigo, marigolds, Japanese bell flowers, nicotiana, salvia and catch-fly.

When making cold frames or hot-beds, five handfuls of hardwood ashes can be added to each frame the size of the ordinary sash.

MIXED FERTILIZER FOR THE LAWN.

Five pounds steamed bone meal, six pounds dried blood, two pounds nitrate soda, two pounds air dried fine soil. Use one pound per five square yards. Apply as a top dressing early in the spring.

MIXED FERTILIZER FOR GARDEN.

Five pounds nitrate soda, eight pounds dried blood, eighteen pounds acid phosphates, six pounds air dried soil. Apply as a top dressing early in spring at the rate of one pound to every five square yards.

When transplanting one teaspoon bone meal can be mixed with the earth around each plant.

BEE-KEEPER'S COLUMN.

Conducted by Francis Jager, Professor of Apiculture, University Farm, St. Paul.

The University Division of Bee Culture this year plans to supply Minnesota beekkeepers with untested three banded Italian queens at 50c each and tested at $1.00. Not more than four untested and one tested queen will be sent to any one beekeeper. Cash with order must be sent to "The Cashier, University Farm, St. Paul, Minnesota." Orders will be filled in rotation as received. Queens will be delivered as soon as conditions are right for raising good queens. Orders specifying that queens must be delivered on a certain day cannot be accepted.

The University Division of Bee Culture is not in the queen rearing business, but is attempting to raise the standard of stock of bees in Minnesota by supplying to Minnesota beekeepers a few high "blooded" queens at cost of production, for breeding purposes.

There is no foul blood anywhere near our queen rearing apiary. To date, March 15, 1917, 67 queens have been ordered.

Notices of bees for sale and those wishing to buy bees should be sent in to the "Division of Bee Culture, University Farm, St. Paul, Minnesota."

JUNIOR HORTICULTURAL CLUB.

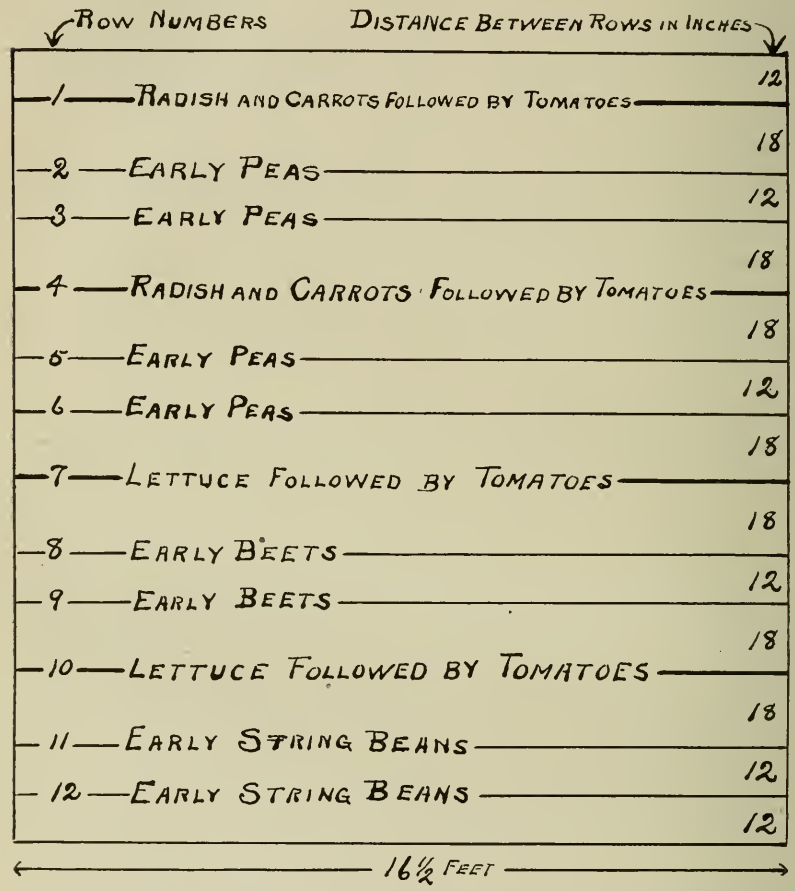
By R. S. Mackintosh, Horticultural Specialist. Agricultural Extension Division, University Farm, St. Paul.

Greetings to the boys and girls who have enrolled in the Junior Garden Club. We are starting out to produce something and the motto is: "Make the Better Best." The motto means that we are going to do our best to grow the most and best vegetables and to market or can them in the best way possible. Thousands of boys and girls are working under this motto this year and in the South, where the season opens early, they are now at work. In Minnesota we cannot start so early, but we shall start just as soon as the time comes.

The soil in the garden needs special attention, because it is in it and from it we shall get the fine vegetables. A sandy loam is probably best for most vegetables, but we must use what we have. Just as soon as the frost is out, and it is dry enough, plow or spade ground thoroughly to a depth of eight inches. If it is not rich enough, a three-inch layer of rotted manure may be applied before spading or plowing. A small garden can be spaded in a half hour or so. Keep the surface raked or cultivated after each rain to prevent its drying out.

Before the land is ready to work a plain and accurate plan must be worked out, so that you will know where every seed or plant is to go. George Washington, while president, managed his Virginia farms in a very careful manner. He had rotation plans made for several years in advance, so that he knew what was to go in each field on each farm each year. Our young gardeners should make a good plan. It will be useful

next fall when the story of "My Garden Work" is written. Do not fail to make a record of everything done, for it will make it easier for you to write a good story. The plan shown here is for a garden a rod square, the smallest sized garden allowed. It is hoped that each garden will be larger and more vegetables grown. If you will notice the plan carefully you will see it calls for the growing of seven kinds of vegetables.



Just before the seeds are to be planted the garden should receive another raking. This time all lumps, stones and rubbish should be raked off and the surface left perfectly even. This takes some time and skill. At the corners and the ends of rows drive stakes into the ground even with the surface. Two nicely pointed stakes and some strong twine are needed to use in marking the rows. When through work wind the twine on the stakes and put away in a safe place. This is a good motto: A place for everything and everything in its place. Therefore, keep the hoe, rake, spade and line in their places when you are not using them. Keep all tools clean and sharp. A good adage is: It is just as easy to learn

to do a thing right as it is to learn to do it wrong. Suppose we keep this in mind all the time.

The seeds of radish, lettuce, carrots, beets, and peas may be planted just as soon as the soil is ready. Beans cannot be planted with safety until about corn planting time. Tomato plants should not be set until about the first of June. The time for planting depends upon the season, consequently it cannot be given exactly.

Starting tomato plants. If the tomato is selected as one of the chief crops it is necessary to think about the plants to be used. If you are to grow them at home the seed should be bought right away and planted in a box. The box, commonly called a flat by gardeners, is any kind of a box in which seeds are planted or plants set before transplanting to the field. A flat 12 by 16 inches and three inches deep is about right. Bore a few holes in the bottom to allow the surplus water to escape, cover each hole with a piece of paper and then fill the flat with nice garden soil. If the soil is heavy it should have sand mixed with it to make it lighter. Sow the seeds in drills about one-quarter inch deep. Cover the flat with a pane of glass and keep in a warm, light window. When the first true leaves appear transplant the young plants into another flat, setting them about two inches apart.

Sowing the seeds in the garden. Stretch the line from stake to stake on row one. You will want to have the rows straight, so pull the line tight. With a clean hoe, spade, or other tool open a narrow trench about one inch deep. Do not move the string, for if you do the row will be crooked. Mix the radish and carrot seed and carefully scatter them along the bottom of the furrow, dropping from fifteen to twenty-five seeds to each foot of row. Cover carefully by pushing the soil back over the seeds and do not cover more than one-half inch. Slightly firm the soil a little with the back of the rake or hoe. The radish seed will germinate in a very few days, but it will take ten days or more for the carrots to start.

For rows two and three, dig the trench two inches deep and sow about a dozen seeds to each foot of row. Cover about 1½ inches deep. Rows 4, 7, 8, 9 and 10 are treated the same as number one. The beans are planted the same as the peas, except that they should not be planted until the soil is warm or about the time corn is planted. In rows 1, 4, 7 and 10, tomato plants are to be set three feet apart. All the carrots and beets should be used or canned before the tomato plants grow large enough to use all the space.

Good varieties of vegetables for small gardens: Tomato—Bonnie Best and Earliana; Radish—Scarlet Globe or White Tipped; Lettuce—Black Seeded Simpson or Grand Rapids; Peas—Alaska or American Wonder; Beet—Detroit Dark Red or Eclipse; Carrot—Oxheart or Danvers Half-Long; Bean—Refugee or Wardwell.

ANNUAL MEMBERSHIP, 1917.—At the time of writing this note, April 20, the *annual* membership roll for the current year stands at 2,431, the number at this date being 157 more than the number standing on the membership roll in 1916 at the same date. This does not necessarily mean that the membership at the close of the year will be larger than for the year 1916. We can hardly hope for an increase over that maximum number, although we are working to that end.

SECRETARY'S CORNER

PROSPECTS FOR THE HORTICULTURAL BUILDING.—The building committee was in session on Friday last, the date of the great storm, in the afternoon with the Finance Committee of the Senate and in the evening with the Appropriations Committee of the House. There were present at this meeting, representing the society, Pres. Cashman, Messrs. S. B. Crosby, of St. Paul; E. A. Smith, of Lake City; Ed. Yanish, of St. Paul; John P. Andrews, of Faribault; Dean A. F. Woods, of University Farm, and the secretary. Every member of the committee present had some part in this appeal for the Horticultural Building, and from the character of the reception which was accorded us we are hopeful that our request will be granted and the building constructed the coming year. The need of such a building for the general uses of other societies beside our own is evidently fully recognized, and we feel sure eventually our request will be granted.

A VALUABLE SEEDLING ORCHARD.—John Bisbee, of Madelia, has a seedling apple orchard of a number of acres. I do not know how many nor how many trees it contains, but I understood him to say when he was in the office a few days since, showing me a number of long keeping varieties of apples which originated in his orchard, that he had seven hundred trees that ought to have borne last year, something over a hundred that did bear. One seedling, very much like the Baldwin in appearance, of which however he does not consider it a seedling, of medium size and dark red color, very firm and solid in the middle of March, having been kept in an outside cellar, is evidently an apple of considerable value. He reports that the apples never blow off from the tree. As to quality it is sub-acid and by no means a bad eating apple, certainly a good variety to build from, and we understand Mr. Bisbee is saving seed from this as from others of his valuable seedlings—and the fact that he is now seventy-eight years has no bearing whatever on his continuance in his work in growing seedlings, which he will undoubtedly continue to do as long as he stays with us. We are promised a full exhibit of seedlings from his orchard at our next annual meeting and anticipate it will be a splendid collection.

PASSING OF L. R. MOYER.—With great regret we note the passing of our dear friend and fellow-member, Lycurgus R. Moyer, which occurred March 14, following a very short illness from pneumonia. Few men have been held in higher esteem for their service to the public than Mr. Moyer. At the time of his death he was president of the village council and actively interested in every subject of importance to the welfare of the community in which he lived. He had operated a trial station for a great many years at his home in Montevideo, and the reports of his experiment work there have appeared regularly in our periodical, the last one which he will make for us being published in this number. Like all of his reports it contains matter of very much interest and deserves careful reading on the part of every one of our members.

Mr. Moyer's name appears first on our membership roll in the year 1889, and he has been a member continually since that date. The card index of the services of our membership kept in this office shows that few members have contributed as much to the work of this society as he. The matters of special interest of which he has written are largely about some phase of ornamental horticulture, and his place in our society in that field ranks first all these years without question. In this phase of our work he will be especially missed. In the year 1895 Mr. Moyer was elected a member of the Executive Board of the society, a place which he filled with singular fidelity for seventeen years. We hope to publish a suitable biographical sketch of this much endeared member, who has now passed on to his reward.

LYCURGUS R. MOYER.

Late of Montevideo, Minn.

(See opposite page.)

While it is not the intention to publish anything in this magazine that is misleadng or unreliable, yet it must be remembered that the articles published herein reclte the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 MAY, 1917 No. 5

IN MEMORIAM—L. R. MOYER

Passed March 13, 1917. Aged 68 Years.

In gathering material for this tribute to the memory of our departed brother and co-worker, there was sent me copies of the newspapers published in his home town, and I found that I could not do better than to incorporate extracts from what these writers from his home said about him as a result of a long personal acquaintance. From the "Montevideo Leader" I have taken the following, which describes so very fully, certainly better than the writer could do, the character of this man of unusual public spirit and devotion to the common good.

"Our friend and neighbor, L. R. Moyer, has passed from this life and our people are in deep sorrow. For more than forty-five years has he been closely identified with the social and business life of this community and from a mere hamlet has seen Montevideo grow and develop into a beautiful and prosperous city. During all these years he has been its steadfast friend and supporter, ever watchful of its good name, ever ready to serve its best interests. Always has he stood for the things that are worth while—for true character, temperance, education, good government, good morals, right living and a genuine, heart-felt Christianity. Always when our people have gone to him for counsel or advice have they found him solicitous for their welfare and anxious to be of some real service.

"Modest and unassuming to an extreme, he filled every station to which he was called with marked ability and discharged every duty with true fidelity. No other man has so strongly im-

pressed himself upon this community or exerted so great an influence for the good of all. In a thousand ways has he served our people so faithfully as to merit their recognition of him as our most distinguished citizen. He has passed from the activities of this life but his good deeds will live as a precious memory in the hearts of a grateful and appreciative people."

From the "Montevideo Commercial" I have taken the following brief outline of Mr. Moyer's useful life:

"L. R. Moyer was born on a farm in Niagara County, New York, October 29, 1848. His early education was at a district school near his home. Later he entered a high grade school in Lockport, N. Y., and so devoted was he to his studies that his health thereby became impaired, and he came to Hudson, Wis., in the fall of 1868. Taught school for one winter near Lakeland, Minn. After spending one year at Duluth he came to the Minnesota Valley on foot, having walked all the way from Benson, arriving here in August, 1870, when all there was to Montevideo was a log hotel and a small dwelling on the site of Chippewa County State Bank. His occupation at that time was that of a civil engineer, which consisted mainly in land surveying. He soon filed two choice tracts of land, one he took as a homestead and the other as a promotion claim. The latter he owned at the time of his death, near Camp Release Park.

"He was admitted to the bar in 1875, and the same year the firm of C. H. Budd and L. R. Moyer was formed, which for many years was known as Budd & Moyer. In 1875 the firm did some banking business and in 1877 with a third partner organized Chippewa County Bank. In that small bank building the beginnings of the Montevideo Public Library were carried on with a few magazines and a small collection of books. Mr. Moyer was elected soon after to the office of County Surveyor, which office he held for thirty years and was also for twenty years of this period Judge of Probate. He served several years on the public school board and has been for many years a trustee of Windom College, formerly Windom Institute. He was a life member of the Minnesota Historical Club and the State Horticultural Society. Was a member of the American Association for the Advancement of Science and of the Torry Botanical Club. He devoted much time to the study of botany and has one of the finest herbariums to be found anywhere. He was president of Chippewa County State Bank at the time of his death, and was one of the directors since its organization as a State Bank. He was a member of Sunset Lodge No. 109, A. F. & A. M. and a charter member of the Montevideo Fire Department and was president of the City Council.

"Lycurgus R. Moyer, lawyer, banker, naturalist and poet, son of Amos F. and Cornelia Rose Moyer, married Anna Wightman,

of Mauston, in 1876. Six children were born to this union. Waldo and Burrows died some years ago. Sumner, Amos, Catherine and Rose survive."

Judge Moyer, as we commonly term him in our society, became a member of the association, at least his name then first appears upon the membership roll, in the year 1889, the second year preceding my connection with the society as secretary. My acquaintance with Judge Moyer began at that time, and with the official relationship which he maintained with the society up to the time of his death there existed also a close acquaintance, which was ever a pleasant and, to myself at least, a profitable one.

During all these years Mr. Moyer conducted a trial station for the society, and, considering the extensive field that his trial service covered, I am sure that no one will be offended at this statement that the most important trial station reports, including both fruits and flowers, that were published by this society came from his pen. In support of this statement, I call your attention especially to his last report, to be found in the April number of our monthly for this year. The card index of the contributions of our members to the work of the society shows that Mr. Moyer had contributed sixty-four articles, most of them reports from his station, though aside from this there were a number of especially valuable articles on some phase of ornamental horticulture, in which Mr. Moyer was especially interested.

In the year 1895 Judge Moyer was elected a member of the Executive Board, which position he filled with distinguished fidelity up to and including the year 1913, in all eighteen years. At his age and state of health we anticipated his being with us for a long period of service yet, but we must bow to that inscrutible wisdom which determines events from a standpoint altogether beyond our reach.—Secy.

The Successful Orchard.

PROF. S. A. BEACH, HORTICULTURIST, AMES, IA.

Orchards, as I see it, divide naturally into at least three classes. We often hear the home orchard spoken of in distinction from the commercial orchard, but I wish to make a distinction in the different kinds of home orchards.

Domestic orchards:—First of all I recognize what I like to call the "domestic orchard." It should be called the domestic orchard when it is planned and operated primarily for the simple purpose of supplying the family with fruit. We have many home orchards that do more than that, so the words "home orchard" do not mean quite the same as the words "domestic orchard." The domestic orchard should exist on every farm and, so far as possible, at every home. I should like to see every home in the suburban districts, and even in the cities, supplied with fruit trees, wherever they have room enough to grow trees. I should like to see them devote some time to the domestic orchard. I believe this would tend to do two good things. It would tend to put the man, the children of the family and the wife and mother in familiar touch with one of the most interesting parts of God's creation,—plant life. It would help to rest their minds and give them fine recreation aside from what they might get on the baseball field or the football field or on the golf links or in the club or sewing society. Resting and re-creating their mind and body thus in a natural way, it would tend, I believe, toward the development of more simple and wholesome standards of life and thought.

I firmly believe that the One we look to as the ideal man did this very thing. Read in the gospels the accounts of His life. He was something more than a carpenter that simply was busy in his shop. As His work took Him back and forth among the different families of His home community where carpenter work was needed, He not only did His work but kept His eyes open to see the things of nature. He talks most interestingly about vineyards. Some of the most important lessons which He left with His disciples were those in which the vine was taken as the illustration of the truths He wished to impress. Again He pictures for us the person who thought he had no further use for the unfruitful tree, but his gardener put in a plea to let it stand one more year till he could fertilize and stir the soil and give it one more chance to fruit before cutting it down. We have also His refer-

ences to fig trees, olive trees and lilies of the valley. All this goes to show that this man, whom we look to as the ideal man, had His eyes open to nature and that He was a close observer of plant life, of that part of God's creation which is exemplified in the trees and the fruits, the farm crops and the flowers.

I believe, then, that every home, whether it be in the city, in the suburban districts or in the country, is distinctly the loser if it has not about it some cultivated form of plant life. I am told that in New York City some of the ladies of the most exclusive families are becoming enthusiastic over roof gardens and window gardens, if they cannot get any ground upon which to grow flowers. These ladies are taking this up as a fad perhaps, but it surely is a most wholesome fad. They will be better persons because of their love and care for flowers.

Commercial orchards:—But to return to the "successful orchard"; that is what we started to talk about. First, as I have said, we may put into one class all domestic orchards. At the other extreme is the orchard which is designed primarily as a commercial proposition and where everything bends to that purpose. In some cases they have no other crops on the land. They do not even grow the hay or the alfalfa which they need to feed their teams or even their cow. The whole place is planted to fruit. That is the purely commercial orchard.

Farm orchards:—But we have a great many orchards on farms, and I take it that our Minnesota farm orchards will come in here. We have a great many orchards on our farms which are something more than domestic orchards and something less than strictly commercial propositions. Let us try to get before our minds a composite picture of this class of orchards as they are scattered over Minnesota. Hundreds of them are less than an acre in extent; others may run from three to five or even ten acres. They are our farm orchards. What can be done towards making these farm orchards more successful? I wish to take up that proposition first before taking up the practical question of trying to establish a new orchard. I believe it is a good principle to follow, to first make the best we can out of what we already have in our hands and then go on from that to something better.

One of the finest things that this Horticultural Society is doing, and one of the finest things that the State Agricultural College is doing, is to stimulate greater interest along the lines of making these farm orchards better orchards. I firmly believe

if the owners of these orchards could be induced in some way to give them the right care and the right management that inside of two years Minnesota could double the value of her orchard output, and show a very high percentage of increase in yield and quality of fruit in a short time. I believe this could be done if only the people who have the care of those trees would give them the kind of care and management which is necessary in order to make an orchard successful.

I should like to bring to your attention as illustrating this point of view some concrete examples from our own experience. In your sister state to the south, we are engaged in extension work among the farmers, as you are. Notwithstanding the fact that we are growers of corn and of hogs and of cattle, we are becoming increasingly interested in Iowa in the production of good orchards. One of the ways in which we are doing this is by carrying on demonstrations in orchard work in different communities over the state.

One of the plans is to work together with the extension poultry expert and arrange dual orchard and poultry demonstrations. If they can't get the folks interested in one they may in the other. When the subject of spraying comes up it is shown that the spray pump can be used to spray the poultry house to rid it of lice and vermin, and also to spray the orchard trees to protect them from the insects and diseases that prey upon the orchards. At the same time the young man can use it to wash the buggy on Saturday afternoon preparatory to the customary use of it on Sunday. It can be used to wash windows and porches and for various other purposes. So they induce people to take an interest in getting a spray pump.

When that is done they have made a long step in advance. Why? Because one of the reasons why orchards are not more successful is because of the insects and diseases that prey upon them. If we can only put in the hands of our people a method of controlling those insects and diseases and give them confidence that they may control them if they will, we can get more of them to produce good fruit. Fruit is absolutely the best thing we can get out of any orchard. We cannot produce good fruit if we leave the orchard a prey to every insect and every disease that comes along. It must have our assistance.

Let me tell you about one of these demonstrations. This orchard is located in west central Iowa, where there is a vast stretch of fertile country, similar to what you will see here in

Minnesota in the corn districts, which are primarily given over to the growing of corn and hogs and cattle. In the midst of that level prairie is a farm which has an orchard of a little less than four acres. It was planted by a man who had an enthusiasm for trees. It passed into the hands of the present owner, perhaps eight or ten years ago. The orchard was planted from 1891 to 1894, and so is about twenty-two to twenty-five years old.

In 1915 our men first succeeded in interesting the owner in putting on a joint demonstration on pruning and poultry for the benefit of the neighborhood. They held an orchard meeting and got the neighbors to come in and see how to prune the trees. After that they sprayed the chicken house. The owner finally became so much interested that he decided to use the orchard for a demonstration in spraying. So they sprayed certain trees and left others unsprayed for comparison. They sprayed three times. In all the years before 1915 the owners had gotten enough apples out of that three and one-half-acre orchard to supply the family, and one year they had fruit to sell. But, as the result of spraying this season they had a gross return in money of over $600.

Naturally the owner became interested. He discovered all at once that was the best three acres he had. In 1916 he wanted the demonstration again. I had the privilege of running down there one Saturday when the apple harvest was on. He had invited in all the countryside to his orchard. He had left a few trees unsprayed. I think I never saw a worse attack of scab and insects than I saw on some of those trees. I don't dare tell you the difference between the sprayed and the unsprayed trees because you wouldn't believe me, but I can say it was a remarkable difference. This year he had gross returns of about $800 out of that orchard. The varieties were just the ordinary varieties gotten from our local nurseries in central Iowa from 1891 to 1895.

A Member: Was that fruit sold locally?

Prof. Beach: That fruit was sold locally and without packing. He put up only about 100 barrels. Aside from that it was sold to the farmers who are more interested in growing corn than they are in growing apples. I saw one box of Jonathans that Saturday that was auctioned off to one of the farmers. He paid at the rate of over $2.00 a bushel to get that box of selected apples.

We believe that if we can get a few locations like that in every county it can't help but stimulate interest among our people in taking better care of their orchard trees.

I wish to give you another illustration. I have here some of

the blanks which we send out asking them to give us returns on their orchards. I have here the blank which we received from a gentleman by the name of Charles O. Garrett. He has an orchard farm east of Des Moines about thirteen miles. We asked him for his report for 1915. Mr. Garrett was brought up on a farm. He has gradually given more and more attention to fruit growing and less attention to general farming. These are some of the questions we asked:

Q. How many acres did you have in apples in 1915? Ans. "Forty acres."

Q. What was the yield per acre? Ans. "Two hundred bushels to the acre." Mr. Garrett is one of the most progressive of our orchard men.

Q. Did you prune? "Yes."

Q. Did you spray? "Yes."

Q. What did you spray with? "Lime sulphur and arsenate of lead."

Q. How many times? "Three times."

Q. Net returns per acre? "$150. Net returns for the orchard $6,000."

In contrast with that, are the replies from a man who has a farm of about 1,500 acres, but who is interested in stock rather than in the orchard. His father, however, did plant out a twenty-acre orchard of Jonathans, which are now fine trees of bearing age. The orchard was cultivated until the trees were about twelve years old; they are now about twenty years old.

Q. How large was the crop in 1915? Ans. "Four hundred bushels on the twenty acres."

Q. Total gross returns per acre? Ans. "Five dollars."

Q. Cost of production? Ans. "Nothing."

Q. Did you prune? "No."

Q. Did you spray? "No."

You see he was not interested in the orchard. I believe in the hands of Mr. Garrett there might have been turned off at least $3,000 from that twenty acres of Jonathans.

I could give you a great many other illustrations of this kind, gentlemen, but these must suffice. They will call your attention to the fact that we can make our orchards more successful if we adopt the right methods.

First of all I would say it is desirable to have good varieties. You may not be able to get the very best varieties to live here, but you can get good varieties that are hardy enough to stand in this climate.

Second. The management of the soil should be such as to make conditions favorable to the vigorous and healthy development of the roots. Should the orchard happen to be in a dry

location be sure to incorporate an abundance of vegetable matter in the soil so that it can better hold moisture. If necessary give it as thorough cultivation as you would corn. Don't be afraid to manure it; that is one of the best things to do, not simply for its fertilizing value but also for the good it does in increasing the capacity of the soil to hold moisture by increasing the humus in the soil. The roots should have a steady supply of moisture and not be smothered at one time with stagnant soil water and dry at another. If needed, tile the land.

I know nurserymen who will rent, say, eighty acres to plant to nursery trees. They are located on a stiff clay loam. The very first thing they do on this soil is to put through it tile drains two rods apart. These nurserymen cannot afford to grow trees on soil where part of the time the roots would have too much moisture and part of the time not enough. They rent it for five years at an annual cash rent of $12 to $18 an acre. They must make their location the very best possible by attending to the condition of the soil as well as to the condition of surface drainage and air drainage. Orchardists should do likewise.

Then it is desirable if you are laying out a new orchard to have it located accessible to the market. Statistics show that the man who is located a mile from market can haul six loads of fruit to market a day with one team, whereas the man who is located seven miles from market will haul less than two loads, about one and nine-tenths on the average. That makes a lot of difference. The questions of labor and of supplies and all such things enter into the problem; so the accessibility to market and the haul that you are obliged to make are things worthy of consideration if you are planting a commercial orchard.

In regard to varieties, if you have not the right kinds you may be able to remedy that by top-working to desirable kinds. I was on Mr. Wedge's place a few years ago, at Albert Lea, and saw Hibernal and a lot of other trees top-worked to Windsor. The trees were so loaded that some of the branches touched the ground. The Windsor is a red winter apple of good quality. The grafts were none of them more than five years old. They ran somewhere from three to five years old. If you have varieties in your orchard that you don't like you can often change them to advantage by top-working to some better kind.

Last of all, I should say that whether or not we have a successful orchard will depend not upon its location, not upon its purpose, not upon its accessibility to market, but upon the study and the intelligent care which the man behind the orchard gives it. It depends in the final analysis upon the man.

Two Thousand Pounds of Honey in 1916.

MRE. J. A. DE LAMATER, MINNEAPOLIS.
READ BEFORE 1916 ANNUAL MEETING MINN. BEE-KEEPERS' SOCIETY.

First I shall have to go back to the season of 1915, as the work you do with bees each season helps or hinders them the next year.

In the spring of 1915 I had nine colonies that produced 700 pounds of honey. After the honey flow was over, I increased to twenty-four colonies, using nearly all my drawn combs, buying some queens from the Minnesota University, Division of Bee Culture, and raising some during the honey flow. By feeding sugar syrup for winter stores, all weighed sixty pounds or over. I took twenty-four colonies from the cellar April 4, 1916, but found that four colonies that I had not re-queened were weak and so combined them, leaving twenty colonies to commence the season of 1916. I used Minnesota bottoms and flax board on top of hive, wrapped all with heavy paper, and then put on a telescope cover. The bees were then protected from the cool mornings and nights of spring and fall. When taking bees from cellar, I mark any that seem light and give them a comb or two of honey that I have saved for that purpose. When weather is warm I equalize my colonies and clip my queen's wings on one side.

About May 11, 1916, I found my bees needing more room, as they had from seven to nine combs of brood. Then I took a super of drawn combs and put below the brood nest, putting a comb of brood with the queen and one frame of honey in the center, then the rest of the brood in the second story, wrapping both with wrapping paper. In about two weeks I changed the supers around, putting the brood below and the empty combs and honey on top, cutting out any queen cells. I carry them along in this way as far into the clover flow as possible, giving the queen both the hive body and super to lay in. About June 11 the bees were making preparations to swarm, with white clover yielding. Take a super of empty combs if possible, or frames of foundation, and put the queen with one frame of green brood and one frame of honey in the center of this super, putting it next to the bottom board and queen excluder on top, then another super on top with empty frames, with one frame of honey in the center, as this is where the honey is to be stored. Bore a three-eighths-inch hole in the center of this super so the drones can get out, then put the rest of the brood on top, making three supers above the queen excluder (*if there is brood for two more supers*). The nurse

bees will be taking care of brood in third and fourth supers, and field bees will be attracted to the lower brood chamber, where the queen has plenty of room to lay.

Now you must look for queen cells in the third and fourth supers and cut them out, or you can use them in making increase if you wish. You will find as fast as the brood is hatched your supers will be filled with honey, and if more are needed put the empty one next to the brood chamber.

Apiary at St. Paul, on place of J. Alf. Holmberg.

Leave honey on the hive until well ripened. With this method I only had three swarms, and this season was a hard one in which to control swarming. My bees also drew out over four hundred combs this season.

WHAT ABOUT YOUR BACKYARD?—The soil is probably hard and unyielding as lacking in plant-food. If you want to have a garden or even a lawn, you'll have to get to work early next spring, or sooner, if the ground isn't frozen. Spade thoroughly. Work over the upper three inches with hoe and rake. Break all clods fine, take out stones and rubbish, and add a dressing of manure. Work it into the soil well, until it is like part of the soil. Arrange to add your fertilizer early and work it well into the soil. First, however, get the soil in good physical shape by the above method of preparation.

The Magic of Flowers about the Home.

MRS. W. C. LINDERMAN, MARENGO, ILL.

I wonder why we cling to the old theory that to make our surroundings beautiful one must be rich as Croesus, when all that we need to do in God's beautiful out of doors is to just assist dame nature a wee bit, and the surroundings of the most humble habitation will blossom like the rose. This is not just a beautiful theory. I have put it all into practice, and I offer my own little

The house and grounds, "Lilac Lodge," purchased in March, 1908.

effort as proof and will invite you to come into my garden at Lilac Lodge, Marengo, Illinois.

First, I want to show you one acre of land, a house on a hill bleak and barren, not a vine to shelter its unbeautiful lines. It looks like an old lady without the softening films of a veil to hide her wrinkles. The only redeeming thing about the place was at the back of the house, where two rows of lilac bushes over a hundred years old stood as shield and guard. The rows were about one hundred feet long and completely grown together, though originally planted about forty feet apart. It was little work for the good man of the house to trim down these old bushes, thus making a long avenue between that in May, with purple plumes falling on either side to the ground, forms a vista fit for dreams. At the end of this avenue we set up four ten-foot posts, and a bundle of lath made a triangle of lattice on top of the frame. We painted it all white, placed a white garden seat underneath it, then went to the roadside a mile away and dug up two Lombardy poplars to plant in the background. We named it after Marie Antoinette's "Temple of Love," in far off Versailles.

At the head of this avenue we built a framework eighteen feet long and twelve feet wide, covering all with heavy wire. On the sides we planted woodbine and wild grape, and in three years this had made almost a solid growth of living green over the entire framework. In front of this pagoda, if I may be allowed the name for so crude a structure, we planted sumach with beds of ferns underneath. We took the fallen branches of a silver poplar to make a rustic railing for steps, etc., and let me assure you that combined with the wonderful perfume of the wild grape, the tender white and blue wood violets in the spring, it was a bower of beauty, while in the autumn the woodbine and the sumach produced a mad riot of color. In the heat of the day, 'tis like Arthur's island valley of Avalon, a place to say to a weary soul, "take thy rest." Such a setting is a rebuke to all unkind thoughts.

Now, will you go with me to the west side of the house, where live a wonderful old couple whose knowledge of garden lore is past all finding out. The second year after we had purchased adjoining homes, they asked me what I thought of a rose hedge as a dividing line, suggesting rose bushes. I was enthusiastic. In four years that hedge was a feast to the eyes, and though I have seen rose hedges in California, England, Scotland and Italy, yet never have I seen a more luxuriant growth or profusion of bloom than our dividing line rose hedge. In the corner I grouped golden elders, with their lovely creamy bloom in June, turning in the fall to rich purple berries, making a banquet for the birds.

A few feet from this hedge we drove in four posts, used laths for the latticed roof and woven wire for the four sides, and planted around it *"Jackmanii Clematis" for early blooming and the "Paniculata Clematis" for later blooming,* whose small, beautiful white clusters form a most attractive bower. A tiny wild climbing rose, that now is a joy to the eye, runs in profusion over the sides and roof.

I make it a point to name after the donor everything given me for my garden, which gives one's friends a personal interest in the grounds. I covered the floor of my wee house with white gravel, took the old trunk of a tree for a table, for 'tis there we love best to have our four o'clock tea, or it is a place in which our young guests may linger, two by two, for "There's nothing half so sweet in life as love's young dream."

In the center of my lawn, oh joy! is my fish and bird pond. 'Tis but one year old. My friends scoffed at me. "The man of wrath" said, "It could not be done." A landscape man told me

it must be built scientifically, that it must be drained, etc. Well! I have found that the best way to do in gardening is to listen to what everyone has to say and then do as you have a mind to. Yes, to be sure one makes many mistakes, but should never make the same one twice. Truly the difference between anticipation and realization is never more keenly realized than by the amateur gardener. Well, to go back to the pool. I had to have it. I had just reached a point that I could no longer endure without it. I had a hole dug, between two slender cutleaf birches, oblong in

"Lilac Lodge" in 1816—eight years later.

shape, about six feet by ten, and three feet deep. I superintended this work, gaining in avoirdupois and spirituality all the time.

I used the dirt to fill in garden beds that had sunk away. I had the hole filled in with about four inches of cinders, using two bags of cement. I put a border of stones all around the pond, dug a crescent-shaped bed around the back side of it, planted dogwood and tamarix, also used wild ferns and candytuft and "snow on the mountains," *keeping all in white and green.* I filled the pool from the hydrant with my garden hose, and when it became necessary to clean it I used the same hose to siphon it out, took a broom to clean the bottom and then refilled. Three times from spring to October is all that is necessary to empty the pool. Little boys brought me minnows from the creek, that sported and lived in happiness all summer, while the birds came

by dozens for their bath and drink. I never knew, before the arrival of my pool, that we had such a wonderful variety of birds in Illinois, and, would you believe it, two brown thrushes did me the great honor to nest and bring up their family not forty feet from their bathing place.

What lessons Nature teaches us, O restless women! Get out into the wide spaces, for nothing is more interesting than a garden, or more absorbing than watching the birds. I am wondering if birds have memories. With all the other joys of spring,

Rose hedge at "Lilac Lodge."

will they come back, think you, to my pool this second year, mating, nesting, with their glorious melody? After the nests are built, and little families have come, all bird songs seem to wane. Perhaps they are like the humans for, after matrimony, come greater responsibilities, and oftimes "a moan comes with the music."

We had another idea which should be exploded, that aquatics are but for the lily ponds of the rich. In the bottom of my pool I put a box of rich dirt, covered it all around with stones, and planted it with "water poppy" and "water hyacinths." Planted in May, they bloomed all summer. This summer I shall plant some of the hybrid lilies. That little gem of water shining out of the emerald grass is visited all day long, not only by the birds, but by little children, bless them, and even the dogs stop in their mad race to quench their thirst. The friends that scoffed, now pause

to rest; for water in the yard, and an open fire in a room, act like magnets, drawing all congenial things to them.

All around the house proper I have planted woodbine that now reaches the roof. I trained it on heavy wire so that no dampness could injure the frame house. The lattice work and window boxes for the porch are home made. At the end of the front walk, at either side, I have two electric light posts. I was in favor with the gods, for the posts (colonial columns, eight feet high) were cracked and thus unsalable at the lumber yard. They were set in cement to prevent decay, painted white, and on the

The present gateway to "Lilac Lodge."

top were placed two large electric light fixtures that had been discarded and laid in the attic for years; when lo, and behold, with my lights trimmed and burning I feel like the Goddess of Liberty lighting the world.

On each side of our drive we put two slender tree trunks and made an arch on which we painted "Lilac Lodge." At each side we again planted the woodbine. In two years you could not see the framework, and "Lilac Lodge" has to have its whiskers trimmed twice a year to be readable.

It was from this arch we cut our driveway. The cutting out of the sods was by far the greatest expense of all I have had on the place. We cut a circular drive ten feet wide and one hundred feet long around a heart-shaped flower bed, the edge of which is planted with dwarf barberry, the center being filled in with shrubbery.

For all walks and driveways I bed heavily with ashes from the furnace, roll till it is packed tight and cover with a thin layer of crushed rock. The ashes keep white, and one can add a little rock each year, thus making the cost most meager.

On the east side of the house at the foot of the vines, I have á rugosa rose hedge. It is lovely with its beautiful foliage, but I would never advise planting hedging too close to the house.

For three years this hedge sulked like a spoiled child, and sulky flowers are no more to be desired than sulky people, from both of which "good Lord, deliver us."

On the eastern side of my lawn, at its farthest point, is my little rose garden. The most successful are the hybrid teas. Be it remembered that roses should not be put with other flowers. They have the artistic temperament, and for all such we willingly make apologies for bad behavior; we also admire them most and love them best.

For my background of the rose garden, I took two discarded clothes line posts, set them sixteen feet apart and united them with long strips of wood. At the lumber yard I found some odd wooden brackets which I painted white. At one post I planted a Crimson Rambler, at the other a yellow climbing rose, and there you have a pocket edition of the Parthenon—plus roses.

On the front edge of the lot next to the road, banking the archway and in clumps, I have used spirea Van Houttii and Japanese purple barberry.

I am bounded on the east by a most undesirable condition, consisting of an unused lot, whose owner believes in letting nature take it course. I have planted everything I could think of to screen off this grass and weed grown nuisance. I have used sumach, tamarix, mock orange, princess feather, flowering quince and snowballs. This year I shall put in front of it all a hedge of hydrangea. Do not expect that man of wrath, whether he be son, father, husband or brother, to always be in the most gracious mood when you ask him to assist you. Oftimes the bit of help you get is under protest, but good help, with here a little and there a little, will remove mountains. When it is all done the chances are that the dear man will say as he looks about him with all the complacency of the cat that just swallowed the canary, "Ain't nature grand though?" In his more sober moments I fancy he will say, "Behold it is good, we builded better than we knew." If one had not one dollar to spend we could still have beauty about us, with nature's bounteous gifts in the woods, by stream and roadside, to be had, without money and without price.

To oversee my own gardening has not been so much a necessity as a pleasure. It is not my vocation, but my avocation. Nowhere can earth's mortals come in so close a touch with the infinite as out of doors and with a garden. "For him there is no unbelief who plants a seed and waits to see it push aside the sod."

Ginseng Troubles.

A. O. GILBERTSON.

Anyone growing ginseng on a large scale surely has plenty of trouble, even though he makes a fairly good success of the business.

Perhaps it would be of interest to the members of this association for me to give a general outline of what we have been trying to do in the way of cutting down overhead expense in connection with the growing of ginseng on an extensive scale.

We have, at the present time, five and a half acres of ginseng under artificial arbors. We also have a tract of thirty-two acres of natural timber that we have been working with, putting it into condition for planting, and we have, at the present time, growing on this timber tract, about twelve million plants of different ages, the bulk of them being one- two- and three-year-old plants.

One of our main troubles in growing ginseng in the natural shade has been the weed question, and to overcome this difficulty we have found it the most economical to summer-fallow the tract at least three years previous to the planting of the roots. In this way we entirely do away with the expense of weeding even one and two-year old seedlings. We also find that we save the expense of preparing the beds for planting, as the continued working of the soil in this way, for two or three years, leaves the ground exceedingly mellow. Another advantage we have found is that it retains the moisture a great deal better.

After a great deal of experimenting to find some tool that would work the ground satisfactorily, without coming in contact with the roots of the trees, the writer hit upon the plan of cutting down an ordinary pulverizer to the size of six disks. This makes it possible, by using only one horse on the machine, to work in between the trees, even though they are very close together. Our plan is to go over the field twice, going crossways the second time. We also have a special harrow, that we have made, to follow up the disk.

These four operations, two operations with the disk and two operations with the drag or harrow, clean out perfectly all the weeds, with the exception of a few, once in a while, next to the trees. We go over the ground in this way six or seven times during the season.

In going over the ground, the first time or two with the disk, we have a man follow up with a grub hoe, cutting out any large roots that are near enough to the surface to interfere with the disk. In this way we have been able to work up a perfect seed bed at a very reasonable cost per acre.

After having overcome the weed difficulty, our next trouble was the transplanting of the plants. This we have found very

expensive under the old method, especially when one has to set out plants into the millions, but we have been able by our method to cut down this expense to about 20 per cent of the original cost under the old method of using the dibble. One man with the tool that we use can transplant in one day from 10,000 to 12,000 plants and do it easily, besides doing it better.

The plants, when they are ready to be dug for market, can also be dug at a great deal less expense when planted under our method.

We are, at the present time, drying about four tons of transplanted roots. These plants were from ten to twelve years old.

Ginseng growing in the natural shade—at F. C. Erkel's. Rockford, Minn.

We also harvested our first crop of wild roots from our timber tract this fall, about 800 pounds green. We have found it no small task and expense to clean so large a quantity of roots, especially where they are grown in our soil, which is quite heavy, and for this reason do not clean readily.

For washing the roots, the best we have found is an old style barrel churn. In using the churn however, one should be careful to fill the churn good and full with roots, but only about half full of water. In this way the roots will not be bruised in the least, from the fact that they are allowed to move around, but rather the water works through the roots with the motion of the churn.

We have also found it necessary to use a power sprayer in spraying our arbors. Our power sprayer is a machine assembled by us. I might also mention that we use nothing but Pyrox in spraying our plants.

Improvement of Vegetable Varieties by Selection.

RICHARD WELLINGTON, ASST. HORTICULTURIST, UNIVERSITY FARM.

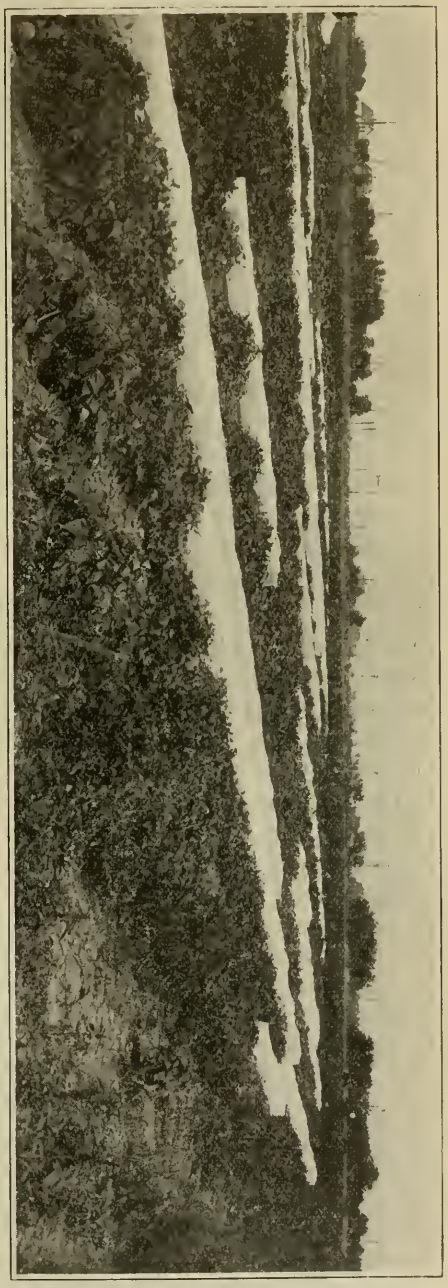
In order to obviate any misunderstanding it is well to define at the outset the word "variety" as it is commonly used and to discuss its status in the light of modern plant breeding. Biologically speaking, it is "an individual or group of individuals of a species differing from the rest in some one or more of the characteristics typical of the species, and capable either of perpetuating itself for a period or of being perpetuated by artificial means." According to this conception a variety is an entity in itself, that is, all individuals within a variety possess identical transmissible characteristics. Unfortunately this is not the case, as many investigators, as well as practical growers, have proven. However, this knowledge furnishes us a working basis to carry on selection experiments.

The methods of improving varieties by selection must necessarily depend directly upon the three methods of propagation, namely, asexual, cross-fertilization and self-fertilization.

Asexual plants are those which are not propagated in a sexual manner, such as the potato. Theoretically speaking, no deterioration, or running out, should take place where this kind of propagation is practiced, but practically it does, as plants become diseased and decrepit by various causes and transmit their weaknesses to their progeny. When degeneration in potato varieties takes place rapidly, as it does at University Farm, probably due to adverse soil conditions, no amount of selection, as has been conclusively proven, will bring them back to their normal state. Such being the case, it is necessary to secure new seed each year to obtain the maximum results. On the other hand, if degeneration takes place slowly then it is advisable to eliminate the weak plants and save only the strong ones, and in this way the general field yield may be increased.

Cross-fertilized plants are those whose flowers are so constructed that either insects or wind can easily distribute the pollen. Examples of these are the squash, pumpkin, melon, cucumber, lettuce, onion, corn, cabbage, cauliflower, radish, etc. Naturally on account of this crossing many weak strains are preserved by the stronger. Corn is one of the best illustrations of this phenomenon, as many experiments have proven conclusively. By self-fertilizing individual plants and by breeding up strains from these many are found to be poor yielders and others good

yielders. In one case the crossing of two medium yielders isolated from one variety of corn gave a much higher yield than that obtained from the field run. Supposing that all the weak strains were sifted out of every commercial variety, and only the strong ones left for intercrossing, then our yields should be materially improved. At the University Farm many strains of Hubbard squash have been isolated and undoubtedly many, if not all, of them will yield less than the field run. On the other hand they are remarkably uniform, and perhaps a cross between two of the highest yielding strains would give a more uniform and productive squash than we have at the present time. Isolation of strains is also being carried on with the greenhouse cucumber, head lettuce and onion with the same object in view.



Bean plants covered with cheese cloth to prevent cross-fertilization by insects—at University Farm.

Self-fertilized plants are those plants whose flowers are of such a nature that they usually fertilize themselves. Illustrations of such plants are the bean, pea, tomato and perhaps the eggplant and pepper. Such plants differ from the cross-fertilized ones in that they do not carry along a lot of weak strains by crossing. However, each variety of this class of

plants contains many different strains, some being superior to others in productiveness or other characteristics. This fact is based on numerous experiments at several experiment stations, including our own at University Farm. Selections of the Refugee bean, 1,000 to One, the Alaska pea, and several varieties of tomatoes, have given many distinct strains, varying greatly in their yielding capacity. It may be of interest to note that this past dry, hot season has upset some of our natural expectations. For example, Earliana No. 10, a high yielding strain of tomatoes, was out-yielded by a supposedly inferior strain, but on the other hand it produced ten more fruits per plant and ripened its fruits earlier. It is apparent that the large number of fruits ripening during the intensely hot, dry weather caused this decrease in yield, but it is expected that, if we have a normal season next year the strain No. 10 will again take the lead.

From all facts at hand it seems that one of the most important lines of investigational work with vegetables is to separate all the commercially grown varieties into their integral components, eliminate the weakest of them, and preserve only the strongest and most productive. Unfortunately, this work must be continued indefinitely, for weaknesses and other deteriorations continually work their way into varieties. We undoubtedly need new fruit varieties for our climate, but this statement does not apply to vegetables, as we already have plenty of good varieties. It is, however, essential to keep our varieties up to their highest standard. Such work requires lots of money, time, and land, which we do not have, but this should not discourage us, but on the contrary make us more eager to secure the necessities which will make our work more proficient.

QUANTITY AND QUALITY IN POTATOES.—"Take care of your yields and the quality will take care of itself," says H. J. Lurkins, Michigan's well-known potato grower and authority, and county agent of Berrien County. Mr. Lurkins has grown an average of 454 bushels of potatoes to an acre on a 25-acre field. Hence, his word should carry some weight. Mr. Lurkins believes in planting none but the highest grade of seed from carefully selected stock grown in a seed plot. He manures his ground heavily a year ahead of the time it is put to potatoes. He plows it early in the spring and re-enforces the manure with a suitable well-balanced commercial fertilizer. He says the potato is a lazy plant and must have its plant-food close at hand, if best crops are to be secured. Mr. Lurkins grows 2,000 to 10,000 bushels of potatoes every year. His yields are high and his quality is always the best.—J. W. Henceroth.

Success in Orcharding.

AN EXERCISE LED BY J. F. HARRISON, ORCHARDIST AND FARMER, EXCELSIOR.

I think, in order to be a successful orchardist, the first thing to take into consideration would be—if I were starting out again—the location of the land. I would also want to take the market situation into consideration, because I don't think you could make a success as an orchardist unless you do. I presume that is the reason, if I am at all successful, because those two things were there anyway, whether I took them into consideration or not. I didn't have experience enough to take those things into consideration, but the market, of course, developed later from our fruit association.

Then I think the next thing to take into consideration is the planting of the orchard and the variety of trees and, of course, that should include also the care of the orchard, which would be spraying and pruning. You cannot make a success as an orchardist nowadays unless you do spraying and also pruning.

The next thing would be variety, and there would be only two varieties for me now. If I was planting out a commercial orchard now I would plant a few Duchess and the rest would be Wealthys. If I was going to plant an orchard of 500 or 600 trees, or a thousand, I believe I would put in about a hundred Duchess. The Duchess always sell well because when the market for the Duchess opens up, along in August, everybody is apple hungry, and they always sell for a good price. My Duchess that I sold this year brought me a good price, a dollar and a half a bushel. I should certainly be careful about getting too many varieties. That is where I made my mistake. I was fortunate enough to put in more than half Wealthys, and other varieties would have gone begging for a market but for the Wealthys, and they have always sold the other varieties.

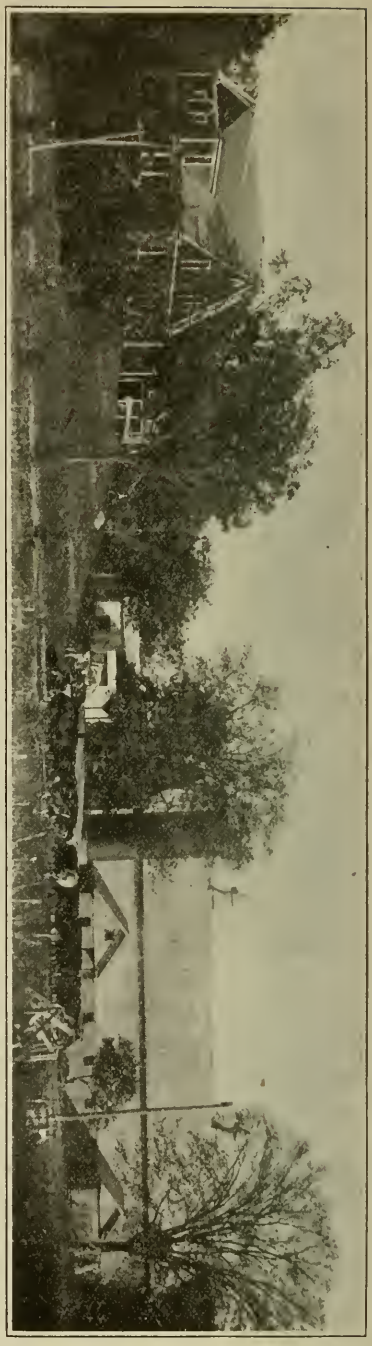
You have got to take the variety that the public is acquainted with and that the public wants. If you take all these things into consideration there is no question about your success as an orchardist.

Another thing, your orchard is like lots of other things, you have got to enjoy it. There is no use of a man going into the livestock business unless he enjoys it. If he enjoys it, it is a source of pleasure to him—and it is the same with the orchard. I know I enjoy my orchard; I have reason to enjoy it.

Once in a while I tell the boys this: When I was a boy—that

is, about the time that Peter Gideon was starving to death trying to propagate an apple for this locality, of course, an apple with us was a thing we very seldom enjoyed. I remember going to school in Chanhassen in a log schoolhouse, and the two Murray girls were our teachers. I sometimes tell the boys that so they will appreciate the orchard. I have four boys and four orchards set out for them, and if they ever take to that and want to farm there is enough there for the four of them. I was going to say that those Murray girls used to bring an apple with them to school, eastern apples, and several of us boys there at school used to take turns in getting the peelings. I tell you, those peelings were fine to me, and sometimes we got the core. You know I made up my mind I would have an orchard for my boys. And once in a while when you see them, after they have eaten ten or fifteen apples, and they begin to throw away a great deal of the apple, I tell them, "When I was a boy that would have been awful good stuff to me," and they would say: "For heaven's sake, never tell about the peelings." This is the first time I have told anything about the peelings and being glad to get them.

Now, they say that no class of people disagree among themselves as much as horticulturists.



The ideal farm home of Jas. F. Harrison, two miles south of Excelsior, Minn.

Each one has his own opinion about different kinds of fruits, and what satisfies one horticulturist don't always satisfy another.

There is another apple I am going to speak about, and that is the Northwestern Greening. This society has not recommended it, but I think it is a profitable apple and would make a profitable orchard. Of course, I have heard people say that after they bear a few years they will die out. I only had a half a dozen of those and still have four of them, and one of those trees bore ten bushels this year. I sold those to a commission man and he said those would bring $6.00 a barrel, or $2.00 a box. Another thing in favor of the Northwestern Greening, I think it would be a good thing to top-work them; I believe we could do that.

What I was going to say about the advantage of them is the picking. They never fall off so you are obliged to pick them. I have seen them hang on the trees all winter. The apples are all perfect. While it might not be adapted to this particular locality, we do know they do raise them very successfully in the southern part of the state and Wisconsin. Some horticulturist may have tried a tree in this locality or farther north and it may have winter killed, while in the southern part of the state a tree may have done well and been very profitable, and I think this is the case with the Northwestern Greening. They have them here on exhibit every winter meeting, and they make a great showing. They make a great showing in a barrel or box after being opened up, and people have found them to be a fine baking apple. Along in the spring of the year they are fine, they are a fine cooking apple, they make fine pies and sauce, and they keep in any ordinary cellar.

Mr. Underwood: This year the Northwestern Greenings were perfectly sound, but some years they spoil in the core. I wondered what the trouble was.

Mr. Richardson: It is the characteristic of the Northwestern Greenings, if the cellar is too warm, to turn brown in the core.

Mr. Underwood: These were on the trees.

Mr. Harrison: I have a root cellar on the north side of the house. It is a cement cellar with a flat top, reinforced with iron and about fourteen inches of dirt.

A Member: How do you ventilate?

Mr. Harrison: I have two four-inch soil pipes, one that goes down just through the ceiling and the other runs down to the bottom of the cellar so that it takes the foul air. They are at the further corners of the cellar. I put a screen in the pipes to keep the mice from coming in. The apples are kept in boxes and barrels.

Mr. Soholt: I would say in regard to the pruning of the

Northwestern Greening, they are easy to spoil and later on, of course, they rot. If you don't prune them right after a few years they will spoil.

Mr. Harrison: Of course, you can spoil any trees if you do not properly prune them. Another thing I found would make a man successful in orcharding, if he had trouble with the old orchard. This idea was not altogether original with me. I bought a piece of ground with twenty-five trees on it that were thirty-five years old. I started in to prune that orchard, I did not cut it all to pieces, but I pruned it quite well, and I got from the young growth that came on those old trees just as fine fruit as the young trees had. You know it is the generally accepted conclusion that the young trees have the finest fruit. I found there was just as good fruit on the old trees thirty-five years old on the new growth as there was on any of my young trees; in fact, some of the finest fruit I ever saw.

This was four or five years ago, and I kept pruning a little each year, and I noticed this year—I only sprayed once—I have finer fruit on those twenty-five or twenty-six trees than the fruit of any other trees I have. I find they do that in the west; every year they cut out some of the old wood and that furnishes new wood, and they say that is the way they keep their fruit. You know what fine fruit we get from the west; those trees are old, and that is the way they get it.

A Member: What can you grow on sand hills?

Mr. Harrison: If I was living in a sandy country I would have an orchard, I know I would, and I will tell you what I would do. I would dig a hole big enough to put in two good loads of yellow clay and I would mulch the tree, and I am satisfied I would grow apples. I would try that. You know we haul clay a long ways. You can afford to haul clay four or five miles to a sandy country to grow an orchard, and everybody ought to have an orchard. (Applause).

Bordeaux on Potatoes.—The use of Bordeaux not only prevents blight, but also stimulates potato vines to greater starch production. This is brought about by a prolongation of the life of the vines. Three successive sprayings during one season will prolong the life of the vines for two weeks. This length of time during the most important period of the life of the vines means an appreciable increase in yields. In years when blight has not occurred, sprayed fields have yielded a profitably larger crop than unsprayed fields.

An even distribution of Bordeaux on the surface of the leaves is highly important. To obtain the best results the spray machine should provide a constant high pressure and the nozzles should give a fine, mist-like spray. Sometimes 50 gallons of Bordeaux per acre is sufficient. If more is necessary it should be used when blight is severe.

THIS YEAR!

A Vegetable Garden for Every Home.

R. S. MACKINTOSH, MINN. AGRI. EXTENSION DIVISION.

The greatest attention should be given to the home garden, especially this year of greatest stress, in order that vegetables produced may be used to take the place of the more stable food products, as grain and corn. It is urged that enough be grown to supply the table during the summer and sufficient amount canned, preserved or dried for two years.

We may know where our food supply is for today, but we do not know where it is for a year from today. It is a well-known fact that the quickest way to replenish our short supply of food is to raise vegetables.

The Minnesota Experiment Station has gathered considerable information regarding the cost of living on certain farms for a period of years. The average cost of growing the potatoes, vegetables and fruits in the garden was only $6.87 for each person per year. This included all the labor, taxes, seeds and other expenses connected with the garden. In a survey made by the United States Department of Agriculture it was found that, of the total food cost, the value of fruits was 6.4 per cent, and of vegetables, 11 per cent or a total of 17.4 per cent. The cost was less in the groups using the most vegetables. In the high meat consuming groups the total food cost was from $20 to $25 per person per year more than in the high vegetable consuming groups. If even $10 per person per year can be saved by the use of more vegetables it means a great saving on the 160,000 farms in Minnesota. These figures easily take the "sting" out of such statements as these: "Fruits and vegetables can be bought cheaper than they can be raised," or "the garden is the most unprofitable part of the farm."

The size of the garden depends upon the number to be fed and the fertility of the soil. In most cases all the vegetables, and some of the fruits, can be grown on half an acre. No doubt a garden 50x200 feet, well fertilized, tilled and planned so as to use every available square foot, will be large enough to supply the vegetables for an average family of five persons. *It is better to have a small garden well tilled than a large garden in weeds.* In a small garden most of the cultivating can be done with a hand cultivator, for it is always ready, while with horse cultivators perhaps the work cannot be done at the right time. One of the

important factors in the success of a garden is to have all work done at the right time and in the right way.

The varieties, amount of seed needed and notes regarding the time of planting, distance between rows and plants are given below in tabular form. The time of planting is relative rather than accurate, for one must use his best judgment in the matter.

Several plantings at ten-day intervals should be made of radish, lettuce and sweet corn to provide a succession; a second planting of beets, carrots, turnips and rutabagas in late July to provide young roots for winter use. Two or more plantings of peas and string beans will provide fresh supplies of these important crops.

GARDEN PLANTING TABLE.

Vegetable.	Varieties.	Amount of seed needed.	When to plant.	Distance— Between rows, inches.	Between plants, inches.	Depth to plant, inches.
Beans, String	Wardwell, Bountiful, Refugee	1 Qt.	May 15	18	4	2
Beans, Pole	Valentine, Kentucky Wonder	1 Qt.	May 25	36	24	2
Beet	Detroit, Eclipse, Egyptian	2 Oz.	Apr. 10	12	3	1
Brussels Sprouts	Dwarf, Long Island	1 Pkt.	Apr. 15	18	15	Plants
Cabbage, Early	Wakefield, Winningstadt	1 Pkt.	Apr. 15	24	15	1
Cabbage, Late	All Seasons, Danish Ball	1 Pkt.	June 1	36	18	Plants
Carrot	Chantenay, Danvers Half Long	1 Oz.	Apr. 10	12	2	½
Cauliflower	Erfurt, Snowball	1 Pkt.	May 1	24	15	Plants
Celery, Early	Golden, White Plume	1 Pkt.	Apr. 15	24	6	Plants
Celery, Late	Winter Queen, Giant Pascal	1 Pkt.	June 25	36	6	Plants
Celeriac	Erfurt	1 Pkt.	May 25	24	6	½
Cucumber	Boston Pickling, White Spine	1 Oz.	May 15	48	36	1
Egg Plant	N. Y. Spineless, Black Beauty	1 Pkt.	June 1	24	18	Plants
Endive	White and Green Curled	1 Pkt.	Apr. 15	18	6	½
Kohl Rabi	Vienna	1 Pkt.	Apr. 15	18	2	½
Lettuce, Leaf	Grand Rapids, Simpson	1 Oz.	Apr. 10	18	4	½
Lettuce, Head	Boston, Hanson	1 Pkt.	Apr. 10	18	6	½
Muskmelon	Gem, Osage, Montreal	1 Oz.	May 25	48	48	1
Onion	White, Yellow and Red Globe	2 Oz.	Apr. 10	16	3	½
Onion Sets	Any color or kind	1 Qt.	Apr. 10	16	2	3
Parsnip	Hollow Crown, Guernsey	1 Oz.	Apr. 15	16	2	½
Parsley	Moss Curled	1 Pkt.	Apr. 10	16	2	½
Peas, Early	Alaska, American Wonder	1 Qt.	Apr. 10	24	2	2
Peas, Late	Telephone, Champion of Eng.	1 Qt.	Apr. 20	36	4	2
Pepper	Bell, Ruby King, Cayenne	1 Pkt.	June 1	24	18	Plants
Pumpkin, Pie	Long or Round Pie	1 Pkt.	June 1	72	60	1
Radish, Early	Scarlet Globe, Icicle	2 Oz.	Apr. 10	16	2	½
Radish, Winter	California, Spanish	1 Pkt.	Apr. 25	24	6	½
Rutabaga	Purple Top, Yellow Swede	1 Oz.	Apr. 10	24	10	½
Salsify	Sandwich Island	1 Pkt.	May 10	16	2	½
Spinach	Long Standing, Bloomsdale	1 Oz.	Apr. 10	12	2	½
Sweet Corn	Bantam, Crosby, Stowell	2 Qts.	May 15	30	18-30	1
Squash, Summer	Scallop, Crookneck	1 Pkt.	May 20	48	24	½
Squash, Winter	Marrow, Hubbard	1 Oz.	May 20	72	72	½
Swiss Chard	Lucullus	1 Pkt.	Apr. 25	24	6	½
Tomato	Earliana, Bonny Best, Stone	2 Pkt.	June 1	48	48	Plants
Turnip	Purple Top, Egg	1 Oz.	Apr. 10	18	2	½
Watermelon	Dark Icing, Tom Watson	1 Oz.	May 25	72	60	1

Summer Care of Strawberries.—On the care which the strawberry plantation receives during the growing season will depend to a large extent the kind of crop there will be next season. The more runners that can be placed with hand and trowel so that the plants will root quickly and be evenly spaced, the better. Very often there are too many plants in one place and not enough in another. Where plants are crowded and much less than six inches apart, the crowns do not develop well and the fruit is liable to be small. It is important to keep the plantation free of weeds and the ground cultivated as long as possible, as late growth, in the case of strawberries, will result in better plants. A light covering of clean straw is desirable when the ground freezes in the autumn, to prevent alternate thawing and freezing in the winter or following spring.—W. T. Macoun.

Economy in Seed Potatoes.

A. D. WILSON AND R. S. MACKINTOSH, AGR. EXT. DIVISION, UNIVERSITY FARM.

Potato seed is scarce and high in price and many persons are asking if it is not possible to use less seed per acre this year. Repeated experiments show that in normal times it is best to use seed pieces weighing from one to two ounces, which means using from ten to twenty bushels of seed per acre. Experiments also show that good crops may be secured by planting pieces as small as one-half ounce in size, or even by planting the eyes dug out of tubers to be eaten.

For Field Planting.—By using medium sized or small potatoes and by cutting into small pieces by hand (pieces about one-half ounce in size), six bushels may be made to plant an acre. It will be necessary to plant such small pieces with a hand regulated planter, or by hand. Special care should be exercised to prepare the soil especially well and not to plant until conditions are favorable, because these small pieces cannot withstand adverse conditions as well as full sized pieces.

Scab and Other Diseases.—Scab is prevented by soaking seed for one and one-half hours in a solution made by mixing one pint (one pound) of forty per cent formaldehyde with thirty gallons of water, or by dissolving four ounces of corrosive sublimate in thirty gallons of water in a wooden vessel. The corrosive sublimate is more effective but is very poisonous when taken internally, although it does not harm the hands or clothing. It must be used with care. It is a crime to allow disease and insects to reduce the yield of potatoes. Hence, spray for bugs and blight this summer.

For the Garden.—Eyes and seed ends of potatoes used for the table may be saved and planted by hand in the garden. The most satisfactory way is to plant these eyes or small seed pieces in soil in a shallow box kept in a warm, light place in the house, and the plants set in the garden as soon as soil and weather warrant, or from May 20 to June 20. It is not advisable to plant these small pieces outside until the soil and weather are warm.

Begin now to cut off the "seed" end of the tubers used each day for table use and put into a box of soil. The box should be three to four inches deep, fourteen to sixteen inches wide, and twenty to twenty-four inches long. Fill with fine garden loam and keep in the house in as light and warm a place as can be found. Be careful to select the best potatoes for this purpose.

The land should be given more attention this year. It should be plowed six to eight inches deep and thoroughly harrowed, especially just before planting. This makes the soil fine and in best condition for the seed-pieces or plants. When ready to plant, open a furrow about three inches deep and put the pieces from twelve to fifteen inches apart and cover with two inches of soil. From this time on keep the surface of the soil loose by constant cultivation.

Spraying Mixture.

PROF. A. G. RUGGLES AND PROF. E. C. STAKMAN, UNIVERSITY FARM.

Arsenate of Lead.

This is probably the best "all around" stomach insecticide yet discovered. It is either a homemade or commercial product. The homemade material is not often satisfactory; hence we prefer the commercial material.

Of the ordinary prepared paste found on the market, use 3 pounds to 50 gallons of water; of the commercial powdered form use 1½ pounds to 50 gallons of water or the fungicide.

The formula for sweetened arsenate of lead to be used on cabbage or radish maggot is:

Lead arsenate paste .....¾ ounce
New Orleans molasses.....½ pint
Water .....1 gallon

If rains wash the mixture off during the time the flies are active, (May 1-20 and July 1-20) spraying must be done over again.

Lime-Sulphur.

Lime-sulphur is both an insecticide and a fungicide. It was first used as a sheep-dip and then came into use as a scale insecticide. Since that time, many improvements have been made in its formula.

The concentrated lime-sulphur is both an insecticide and a fungicide. At the rate of one gallon to nine of water, it is used only when the trees are dormant, at that time killing principally the scale insects. At the rate of one gallon to forty of water, it is primarily a fungicide and is used with arsenate of lead when trees are in foliage. The following is the formula, although it probably is much better to buy the commercial product on account of its constant chemical properties:

50 lbs. fresh unslaked lime 95% pure.
100 lbs. sulphur thoroughly and finely pulverized.
Water to make fifty gallons.

After proper mixing, this must boil 45 to 50 minutes.

See table for proper dilution of concentrated lime-sulphur following on second page.

A resin mixture is often needed to make Bordeaux mixture or other spray compound stick to a smooth surface, such as raspberry canes when spraying for anthracnose. The resin lime mixture is made as follows:

Pulverized resin, 5 pounds.
Concentrated lye, 1 pound.
Fish oil (or other animal oil), 1 pint.
Water, 5 gallons.

Place the oil, resin and one gallon hot water in an iron kettle and heat until the resin softens. Then add the lye and stir thoroughly. Now add the four gallons of hot water and boil until a little will mix with cold water giving a clear amber colored liquid. Make up to five gallons and keep as *stock.*

In using this in Bordeaux mixture, make the 40 gallons as per formula, then take two gallons of this resin-like stock, dilute to ten gallons and add to the Bordeaux mixture or to lime-sulphur.

Resin-fish oil soap, a commercial product, can be used instead of this "sticker."

Potassium Sulphide—(Liver of Sulphur.)

This is a fungicide employed when it is undesirable to have the foliage discolored. It is especially effective against mildew on gooseberry and rust on carnations. A fresh solution is yellowish brown.

Formula—Potassium Sulphide .....3-5 oz.
Water .....10 gals.

Copper Sulphate (Blue Vitriol.)

If trees are to be sprayed when *dormant* it is not necessary to go through the tedious process of making Bordeaux mixture. A solution one pound blue vitriol in 15 to 25 gallons water makes an excellent fungicidal spray at that time.

Soap Solution.

An excellent spray for soft-bodied insects, like plant lice, is made by boiling one pound laundry or Ivory soap in 12 to 15 gallons water. When the soap is thoroughly dissolved it is ready to use. This sprayed when warm is preferable to using the liquid cold.

Nicotine.

The nicotine in tobacco has great insecticidal value. The commercial extracts which are nicotine sulphate are excellent. "Sulphate of Nicotine" and "Black dwarf 40" are two of the many trade compounds. They are the best plant lice insecticides yet discovered. They can be combined in many of the other combined spraying mixtures.

PREPARING BORDEAUX MIXTURE FOR SPRAYING.

4 pounds of Copper Sulphate (Blue Vitriol).
4 pounds of good Stone Lime.

These are to be dissolved separately, each in 25 gallons of water; then pour the two together into a fifty-gallon barrel, stirring thoroughly. This is the proper mixture for spraying apple trees. It is usually considered unsafe to spray plum trees with more than three-fourths of this amount of copper sulphate.

The best way to dissolve the copper sulphate is in a cloth bag suspended in the water. It should not come in contact with metal.

For a combined insecticide and fungicide add three pounds arsenate of lead paste, or 1½ pounds of the powdered arsenate of lead, to each fifty gallons of Bordeaux mixture or diluted lime-sulphur.

Concentrated Lime Sulphur. This material can be made at home, but it is much simpler to buy it on the market, though in any case the material should be tested before used. The material sent out by any of the most reliable firms if left uncovered will change its composition more or less. To test one should have what is called a Baume Specific Gravity Scale, or Hydrometer. These can be purchased for $1 or $1.50 from any large drug company, such as Noyes Bros. and Cutler, St. Paul, or Bausch and Lomb Optical Co., Rochester, N. Y. To get the right amount of dilution, one must have a dilution table such as given in any bulletin or book where lime sulphur is discussed. For instance, if a Baume reading was thirty-two degrees, and you are going to use a dormant spray, you would dilute one part of the liquid with eight parts of water; if you are going to use a summer spray, you would dilute one part of the lime sulphur with forty parts of water. The following table will show the amount of dilution to use with a reading anywhere from fourteen degrees to thirty-five degrees:

DILUTIONS FOR DORMANT AND SUMMER SPRAYING WITH LIME SULPHUR.

Reading on Hydrometer.	Amount of dilution. Number of gallons of water to the gallon of lime sulphur.	
Degrees Baume.	For San Jose Scale. Dormant.	For Summer spraying of apples.
35	9	45
34	8¾	43¼
33	8¼	41½
32	8	40
31	7½	37¾
30	7¼	36¼
29	6¾	34¼
28	6½	32¾
27	6	31
26	5¾	29½
25	5¼	27¾
24	5	26
23	4½	24¼
22	4¼	22¾
21	3¾	21¼
20	3½	19¾
19	3¼	18¼
18	3	17
17	2¾	16
16	2½	15
15	2¼	14
14	2	12¾

Pest	Spray	First Spraying	Second Spraying	Third Spraying	Remarks
		APPLE			
Codling moth, Curculio, Scab, Rust	Arsenate of lead (3-50) plus concentrated lime-sulfur diluted (1 to 40), or Bordeaux mixture (4-4-50)	As center bud in flower cluster begins to show pink	Just after petals fall	3 weeks later	Spraying just after the petals fall, getting as much of the liquid into the calyx cups as possible, is most effectual for codling moth. Give a fourth spraying three or four weeks later if codling moth, black rot, or bitter rot is present. Destroy fallen leaves and all rotted fruit; prune out and burn all cankers; disinfect wounds. Spraying alone does not control rust. Cut out red cedars with ½ mile of orchard.
Aphids or plant lice	Nicotine sulphate	When insects appear			
Scale insects	Lime sulfur (1-9)	Before buds burst in spring			
		CABBAGE			
Cabbage worm	Arsenate of lead (3-50) or Paris green (1-50) Dust with the powdered form or with wood ashes	Whenever worms appear	Repeat when necessary		The poison will stick better to the leaf if used in soapy water.
Cabbage maggot	Sweetened arsenate of lead	May 1-20	July 1-20		
		CUCUMBER			
Cucumber beetle	Arsenate of lead or air-slaked lime or ashes	Dust as soon as insects appear	Repeat when necessary		The adult insects do not seriously injure cucumbers in cold frames, nor do larvae under field conditions.
Larvae or grubs	Tobacco extract on roots				
		CURRANT			
White pickle (plant lice)	Nicotine sulphate	A few days after blossoming	As young leaves appear		When berries begin to turn, use hellebore to prevent discoloration.
Currant worm	Arsenate of lead or hellebore				
Leaf spot	Bordeaux mixture	Just as leaf buds are breaking			
Currant leaf louse	Nicotine sulphate	As buds are breaking			
		PLUM			
Brown rot, Curculio	Arsenate of lead (3-50) plus concentrated lime-sulfur diluted (1 to 40) or Bordeaux mixture (3-4-50)	Just before flower buds break	When plums are size of small peas	When fruit begins to color	Destroy all mummies (fruit shriveled by rot).
Plum pocket	Copper sulphate Bordeaux mixture	Copper sulphate before any growth starts in spring	Bordeaux mixture as soon as growth starts		Prune and burn affected branches in the fall. If whole tree is affected, cut down and burn.
Scale insects	Same as for apple				
		POTATO			
Blight (early and late)	Bordeaux mixture (5-5-50)	When plants are 8 inches high	Repeat when necessary		Vines should be well covered with Bordeaux mixture throughout the season. This usually involves spraying every ten days or two weeks.
Beetle	Paris green (1-50) or arsenate of lead (3-50)	As soon as beetle eggs hatch			
		RASPBERRY			
Anthracnose	Resin-Bordeaux mixture	Before leaves open			Cut out and burn diseased canes; keep old canes cut out. Protect with Bordeaux until canes are at least two-thirds grown. Cultivate close to plants in fall.
Gray bark	Same as for Anthracnose	When young shoots are 6 inches high			
Fruit worms	Arsenate of lead (4-50)				
		TOMATO			
Tomato worms	Arsenate of lead (3-50)	When worms appear	Repeat when necessary		Vines should be well covered with Bordeaux throughout the season. Provide good ventilation.
Leaf spot, Black rot	Bordeaux mixture	Just after the fruit sets			

Note No. 1. In almost every case an insecticide can be combined with a fungicide, and it pays to make the combination when possible.

Note No. 2. Many times a number of insects and diseases can be sprayed against at the

Note No. 3. All spraying formulae have been discussed from time to time in The Horticulturist. Further information can be had by applying to the Experiment Station.

SUMMER MEETING, 1917.

Premium List, Summer Meeting. 1917.

No Duplicating of Varieties Permitted.

OUT-DOOR ROSES.

	1st prem.	2d prem.	3d prem.	4th prem.
Collection—three blooms of each named variety, to be shown in separate vases	$5.00	$3.00	$1.00	$0.50
Collection of named varieties—three blooms of each, in separate vases, amateurs only	5.00	3.00	1.00	.50
Three named varieties, white—each variety in a separate vase, three blooms of each, each bloom on a separate stem	2.00	1.00	.50	
Three named varieties, pink—each variety in a separate vase, three blooms of each, each bloom on a separate stem	2.00	1.00	.50	
Three named varieties, red—each variety in a separate vase, three blooms of each, each bloom on a separate stem	2.00	1.00	.50	
Collection of Rugosa and Rugosa Hybrids—each variety (consisting of one cluster of blooms on a single stem) in a separate vase	2.00	1.00	.50	
Most beautiful rose in vase	1.00			
Largest rose in vase	1.00			
Seedling rose to be shown by the originator. (Not previously exhibited in competition.) Bronze medal donated by the American Rose Society.				

The following named varieties of roses to be entered separately and shown in separate vases, three to five blooms in each vase.

Prince Camile deRohan, General Jacqueminot, Margaret Dickson, M. P. Wilder, Jules Margottin, Magna Charta, Paul Neyron, Madam Gabriel Luizet, Baroness Rothschild, Anna de Diesbach, Ulrich Brunner, John Hopper, Rosa Rugosa (pink and white), Baron deBonstetten, Karl Druski, Madam Plantier, Grus an Teplitz.

Each, 1st prem., 75 cents; 2nd prem., 50 cents; 3rd prem., 25 cents.

PEONIES.

		1st prem.	2d prem.	3d prem.	4th prem.
Vase of Festiva Maxima,	6 blooms..	$2.00	$1.00	$0.50	
" " flesh or light pink	" " ..	"	"	"	
" " medium or dark pink	" " ..	"	"	"	
" " white	" " ..	"	"	"	
" " red	" " ..	"	"	"	
Collection—three blooms of each named variety in separate vases		$6.00	$4.00	$2.00	$1.00
Collection—three blooms of each named variety in separate vases, amateurs only		6.00	4.00	2.00	1.00
Seedling peony, three blooms		3.00	2.00	1.00	.50
Collection—one bloom of each variety, shown each in a separate vase; for amateurs owning no more than ten varities		2.00	1.00	.50	

ANNUALS AND PERENNIALS.

	1st prem.	2d prem.	3d prem.	4th prem.
Vase of Canterbury Bells	$1.50	$1.00	$0.50	
" " Centaurea	"	"	"	
" " Columbine	"	"	"	
" " Dielytra	"	"	"	
" " Delphinium	"	"	"	
" " Evening primrose (Oenothera)	"	"	"	
" " Forget-me-not	"	"	"	
" " Foxglove	"	"	"	
" " Gaillardias	"	"	"	
" " Grass pinks	"	"	"	
" " Iceland poppies	"	"	"	
" " Lilies	"	"	"	
" " Lupine	"	"	"	
" " Lychnis	"	"	"	
" " Annual poppies	"	"	"	
" " Oriental poppies	"	"	"	
" " Pansies	"	"	"	
" " Perennial coreopsis	"	"	"	
" " Pyrethrum	"	"	"	
" " Shasta daisies	"	"	"	
" " Sweet william	"	"	"	
Collection—named perennials, in separate vases	$6.00	$4.00	$2.00	$1.00
Collection of annuals and perennials in separate vases (not to exceed 12) by amateurs who have never taken premiums on flowers	4.00	3.00	2.00	1.00
Collection—named iris, in separate vases, 5 blooms each	3.00	2.00	1.00	
Collection of wild flowers, in separate vases	4.00	3.00	2.00	
Collection of flowers by children	2.00	1.00	.50	
Vase of any kind of flowers not named in this list. (An exhibitor may make any number of entries desired under this head)	2.00	1.00	.50	
Vase of flowers arranged for artistic effect	1.50	1.00	.50	
Basket of outdoor-grown flowers, arranged by exhibitor	3.00	2.00	1.00	

STRAWBERRIES.

One quart of each variety to be shown on plate, not in box.

	1st prem.	2d prem.	3d prem.	4th prem.
Collection (not less than six varieties)	$5.00	$4.00	$3.00	$2.00
Collection of three named varieties	3.00	2.00	1.00	.50

The following varieties of strawberries to be entered separately:

	1st prem.	2d prem.	3d prem.	4th prem.
Bederwood, Dunlap, Crescent, Splendid, Clyde, Warfield, Lovett, Enhance, Glen Mary, Haverland, Minn. No. 3, Progressive, Superb, Americus, each	$1.00	$0.75	$0.50	$0.25
Best named variety not included in the above list	2.00	1.00	.50	
Seedlings, originated by exhibitor	3.00	2.00	1.00	

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So. Minneapolis.

GROWING GARDEN FLOWERS FOR THE MARKET.

It is a decided surprise to find how large a number of garden flowers can be used for the market, but it is no small trick to have at all times an abundance of bloom of the various colors and various styles. One never knows when the call will come for a *yellow* luncheon, a *pink* wedding, a *red* porch party or *white* church decorations. And so there must always be tall flowers and short flowers, and white flowers and colored one. But one garden gorgeous to behold this week may reach the end of its season and be entirely despoiled of its glory next. Is its successor ready? There would be little trouble if all the crops lived up to the February garden plan specifications; but alas, the Iceland poppies, or the early sweet peas, or the daisies, or the asters, or the dahlias, or something else are sure to be put out of sorts with environment—and then what for a substitute? The only safety lies in planning superabundance of bloom (especially as then you'll have something to give away—which is half the fun of having a garden). One day in desperation over a shortage of flowers between crops, in the middle of the summer, I said: "We simply must have flowers to burn." And my aunt, a great literalist, asked, in surprise, "Why, what do you want to burn them for?"

Perhaps you would like to know what flowers we use. As we have no regular greenhouses, our first spring arrivals come from the cold frames where they were started the summer before. Most important of these are the pansies, particularly when they can be induced to long stems. They are very popular for table decorations, corsage bouquets and hospital messages. A sweet, sad little story came to us last year. A friend ordered a hospital bouquet for a friend of hers, and, by chance, along with other flowers, I put in some pansies. When the box reached the hospital, the sick woman was unconscious, but later she rallied enough to see the flowers and recognize the pansies. She wanted those separated from the others and put in a vase by themselves, close at hand. A little while afterward, she became unconscious again for the last time. But it was a pleasure to her friends to know that her last thoughts could be of her beloved pansies.

Along with the pansies come forget-me-nots (star of love and Eliza Fan Roberts), lilies of the valley, violets, Iceland poppies and trolius. A friend receiving some Iceland poppies one year, the first of May, said, "How did you get such summery flowers as these out-of-doors in this cold weather?" Trolius is truly wonderful but is exasperatingly lacking in ambition about filling the earth with its kind. Maybe its seeds will come up two years after planting, and most probably they'll not. So few people know this lovely and comparatively rare flower that its name is something of a curiosity. Some people have called it "petrolius" and others have nicknamed it "Tango Rose."

Bleeding heart, a real old-fashioned favorite, comes early, the columbines, also. The Rocky Mountain variety, with its big blue and white flow-

ers, people here seem to like best, but some of the pink varieties can hold their own well. Valerian, or garden heliotrope, is sweet, as its name betokens, and pyrethrum, or "painted daisies," give one of the showiest gardens of the whole year. After being cut they sometimes become quite languid on a warm day, but I am always sorry when their season makes its adieu.

Mention should surely be made of the flowering trees and shrubs, apple, plum and cherry blossoms, lilacs, honeysuckles (the least satisfactory for decorations), bridal wreath and mock orange, all have their place in a garden flower business.

Iris is lovely for decorative purposes, both in and out of the garden. Peonies speak their own praises. There is a steady demand for marguerites and their successor, Shasta daisies, throughout the summer. Sweet william is reasonably well liked, but it can easily glut the market. Oriental poppies are gorgeous and will hold up for a day or two after cutting. Perennial larkspur is a standard crop, and we are coming to like the annual. Lichnis is worth growing because it furnishes a good red for Fourth of July, if for nothing else.

Sweet peas when they behave well run into money quicker than almost any other flower, but they are mighty notional, and if weather conditions are not to their mind they are not slow in complaining. One always needs a good supply of madder, meadow rue, gypsophila (annual and perennial), and flowering spurge. All will serve in turn.

Gaillardia for a general purpose garden flower is scarcely excelled. It begins blossoming in June and yields heavily straight through to freezing weather in November. It is an excellent keeper and is bright and decorative. Coreopsis is a standard yellow. Achillea at its best and when massed fills many of the requirements for a standard white.

Pinks and forget-me-nots make the dantiest bouquets imaginable. Mignonette is popular, fully as much perhaps for the associations connected with its name as for its own quaint worth. Shirley poppies make a beautiful garden, and, like the Oriental poppies, will serve in the house for a day or two. Snapdragons can be used extensively if you can make them grow freely—likewise garden lilies.

Gladioli should have successive crops all summer and fall. Cosmos is a standard. Everybody knows what asters may or may not be. Golden glow can be used in moderation—some of the best sunflowers quite extensively. Dahlias are more or less satisfactory as cut flowers. Autumn daisies (pyrethrum uglinosum) are especially fine for showy big decorations. Bollonia also has a place. Zinnias, marigolds, wool flowers and mourning brides (scabiosa) are excellent fall bloomers. Michaelmas daisies are interesting and sometimes are of use. And for winter keeping, straw flowers and Chinese lanterns have everything their own way.—Sabra M. Ellison, Okipee Farm, Minneapolis.

N. W. PEONY AND IRIS SOCIETY.

W. F. CHRISTMAN, Secretary.
3804 Fifth Avenue South, Minneapolis, Minn.

How many of our members made a planting of peonies or iris last year that can be expected to bloom this season? Spring is the best time to plant iris, but the fall season is the proper time to plant peonies.

There is certainly a great source of satisfaction in planning your garden so that it may contain new varieties each season that may possibly be strangers to you. It is not too early to become familiar with the location of large representative collections and plan an excursion of investigation with a view of bettering the collection you may already possess. A great number of the recent productions of both the peony and iris are wonderful and greatly excel some of the older varieties. Others, of course, are not to be compared with the varieties that have been in existence for many years, but which are comparative strangers to most of us.

It is a pleasure to report a satisfactory growth of the society, but our aim is high and our ambition is to enroll many more members this spring. We want each member of our society to become a missionary to the cause and send us at least one application for membership or, failing in this, the names of parties to whom we may write with a view of interesting them to join us in our work. Can we depend on you for this? The larger our society becomes, the more we do for you.

Have you labeled or properly marked your plantings so there will be no danger of injury to the tender shoots as they are about to burst through the ground? If you have them protected with a covering, extreme care should be exercised in removing same if the season is well advanced.

As soon as possible this spring, start constant and thorough cultivation, using care not to work too close to your plants, as it is only by thorough cultivation and care that you may expect the most out of them. Remember that any plant must be firmly established and planted where conditions are satisfactory in order to obtain the best results.

One of the chief aims of our society is to familiarize each member with the different meritorious varieties of peony and iris and to encourage their cultivation, propagation and improvement, and we will gladly welcome any inquiries or suggestions that you may have to make along this line.

Don't fail to read Mr. Bonnewitz's paper, "A Business Man's Pleasure With His Peonies," which will appear in the columns of the Horticulturist. It is intensely interesting and brim full of enthusiasm, and was heartily received when read before our society at our mid-winter meeting. We want more enthusiastic members like Mr. Bonnewitz.

We have in preparation material for another bulletin that will be issued in the near future. Each of our members will receive a copy as soon as completed.

The committee appointed to arrange for a flower show this season will doubtless have something definite to report in the near future.

Be free to write your experiences in the growing of peonies and iris, whether they have been successful ones or failures. If failures we feel that we can help you, if successful your experience may be helpful to others. If you have propagated new varieties, send us descriptions so that we may advise others of your efforts. We want to make this a real, live society in keeping with the Horticultural Society of Minnesota, of which we are an auxiliary.—Phone No. 37658.

SECRETARY'S CORNER

PREMIUMS ON FLOWERS. An advance copy of the list of premiums to be offered on flowers at the coming summer meeting of the society is to be found in this number, and prospective exhibitors will see the wisdom of consulting this list promptly and acting accordingly.

NOTE ESPECIALLY in this number first the article on "growing vegetables *this year*" on page 219, on "*economy in seed potatoes*" on page 221, the new spraying calendar on pages 222-5. These are articles of special importance bearing on the extraordinary efforts being made this year to increase the vegetable and fruit products of the country. No true horticulturist should fail to plant a large garden, and no true fruit grower should fail to spray the orchard and other fruit plants most thoroughly, following for this purpose the calendar provided herein.

JAPANESE BARBERRY HARMLESS.—The common barberry, *Berberis vulgaris*, and its commercial varieties, together with some of the less common species of barberry, are unquestionably instrumental in spreading rust.

However, the Japanese barberry, *Berberis thunbergii*, has no connection as far as has been determined with the wheat rust. It has been tried at this station, as well as at many others, for a number of years, and it has never been found to have rust. In any law providing for the eradication of barberry, the Japanese barberry should be exempt.—E. C. Stakman, Head of Section of Plant Pathology, University Farm.

HAVE YOU A VEGETABLE GARDEN?—There are extraordinary reasons why every member of the Horticultural Society should do his part in growing a crop of vegetables large enough for home consumption and some to spare for the neighborhood and plenty to can for a two years' supply. It is not too late when this is received for you to plant a garden, and especially in growing vegetables for use for next fall and winter. On other pages in this monthly you will find practical articles on vegetable gardening, some sound advice from experts in this field, also something about potato growing. We rely upon the members of the Society to do their share in this real national crisis.

VISIT THE FRUIT-BREEDING FARM.—A good time to visit the State Fruit-Breeding Farm, at Zumbra Heights, is in the strawberry season, somewhere about the middle of June. At that time there will be a large field of No. 3 strawberries in fruitage and considerable quantities of a large number of other varieties of strawberries, both June-bearing and everbearing. There will be very many other things besides this of interest to be seen; scores of thousands of apple and plum trees will have blossomed and set fruit as well as quantities of all other varieties of fruits that can not be raised in this climate. The visitor will be especially interested to see crosses of the plum and apricot which we are informed should be in fruitage this year. Take a half day off and visit the Fruit-Breeding Farm. It can be reached by Minneapolis & St. Louis Railroad from Minneapolis to Zumbra Heights station. The farm is about one-quarter mile south of the station.

PLUM TREE PREMIUMS DESTROYED BY MICE.—Something over one hundred members of the society we know are very much disappointed not to receive the plum premium, No. 19, a cross of Compass Cherry and the Climax plum, offered to our membership as one of the plant premiums this spring. These trees were carefully dug and properly heeled in for winter keeping in the storage cellar at the Fruit-Breeding Farm. Usual precautions were taken against injury by mice, but unfortunately they were not successful, as all of this lot of trees had the bark eaten off by mice and were entirely destroyed. Supt. Haralson did the best he could under the cir-

cumstances in putting in some other things, which in themselves are intrinsically as valuable. It is too bad so many should be disappointed in this way, but there is no help for it.

No Horticultural Building This Year.—The present State Legislature has seen fit to refuse the request of the Horticultural Society now for the second time, but we do not feel so badly about this as they also refused practically all of the requests of the State University for buildings, which in the judgment of the Board of Regents are imperatively needed, on account of the high price of labor and building material, and extraordinary demands arising out of war conditions for unusual expenditures. Every item of expense which could be cut out without seriously crippling the state institutions has been refused by the present legislature. As previously noted, hearings were had before both the Finance Committee of the Senate and the Agricultural Committee of the House by the Society Building Committee, assisted by a number of members of the Executive Board. We are informed that the majority of the Finance Committee were favorable towards our proposition, but the House Committee decided against us. No appeal was made to our membership to endorse this proposition, following in this the wishes of the members of the legislature who were endeavoring to secure this building for us. We are not discouraged but hopeful. The situation is better for us than two years ago, and we hope successful efforts may undoubtedly be made with the State Legislature two years later.

Passing of A. J. Philips and Oliver Gibbs.—Since the issue of the last number of the Horticulturist two others of the old members of the society have been taken from us, Mr. A. J. Philips, of West Salem, Wis., and Oliver Gibbs, of Melbourne Beach, Fla. Mr. Philips had been a regular attendant at our meetings for so many years now that he had become well known to all of the members who are present at these gatherings. His practical experience in horticulture and his quaint and humorous way of presenting any subject in which he was interested brought him especially into prominence. There will be a strong personal note in his loss which will touch each one of us who has had the opportunity of knowing Mr. Philips and profiting by contact with his personality.

Mr. Philips was sick at home and then at the hospital at La Crosse in all about three weeks. His death occurred March 22 last. His name first appears on the membership roll of this society in 1876, more than forty years ago, and from personal knowledge of the earliest meetings of the association and its active membership at that time it is more than likely that he attended meetings at an earlier date and was a member of the society, the earlier rolls of the association being kept in an imperfect way, which make the exact date of membership an uncertainty.

Oliver Gibbs came into the society at about the same time. His name appears on the roll first however in 1880. Both Mr. Gibbs and Mr. Philips were made honorary life members only a few years later. Mr. Gibbs was always very prominent in the councils of the association up to the time of his removal to Florida, where the last decade of his life was spent. Very few members have contributed more in a practical way to the work of the association than these two whose names are grouped together in this notice. Mr. Gibbs was secretary of the society during three years, having been appointed to fill a vacancy in 1882, and only resigning on account of the duties devolving upon him as superintendent of the exhibit of the state of Minnesota at the New Orleans Exposition. On account of his absence from the state most of the time for the past ten or twelve years, and his blindness, which for some years has been practically complete, the membership of late years have seen very little of Mr. Gibbs, but the work that he did during his active years for the association had large value and contributed more than can be told in this note to the permanent life and growth of the association. A biographical sketch of Mr. Gibbs was published in the report of this society for 1901, accompanied by his portrait taken at that time. A biography of Mr. Philips is found in the report of this society for 1898. In later numbers of this monthly, some time during this year, "in memoriam" sketches of the lives of these two prominent members will find suitable place

No. 3. Balsam fir and European larch planted alternately, at Owatonna Experiment Station.

(See opposite page.)

While it is not the intention to publish anything in this magazine that is misleadng or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 JUNE, 1917 No. 6

Owatonna Trial Station, Annual Report, 1916,

THOS. E. CASHMAN, SUPT., OWATONNA.

The trees and plants at the Owatonna Station have gone into the winter in good condition, as there was sufficient rainfall to give them the necessary moisture.

I am sure the public generally will be interested in the condition and appearance of the different varieties of evergreens and European larch planted at the station in the years 1886 and 1887 by the late E. H. S. Dartt. That the readers of the Horticulturist may realize the size they have attained and the condition of the white and Norway spruce, Scotch pine, European larch after a period of thirty-one years, I have had several photographs taken.

No. 1 shows white and Norway spruce planted ten feet apart; the trees are planted alternately. The white spruce are the largest and best looking trees, with the exception of one, which is the third tree from the right in the picture.

About twelve years ago, I was visiting the Station with Mr. Dartt, and he called my attention to those trees. He said, "You will notice I have planted white and Norway spruce alternately. This planting will prove some day that the white spruce will in time outgrow, will always look better, and will outlive the Norway spruce." He said, "I will not live to see those results accomplished, but perhaps you will." He said, "You will notice now that the Norway spruce are considerable larger than the white spruce, but this will not always be." And sure enough, the old gentleman's predictions have come true. The trees now are standing from thirty-five to fifty feet high, and with the excep-

tion of one instance the white spruce are considerably larger than the Norway.

The white spruce carries a beautiful green luster the year around, while the Norway presents a dull and somewhat naked appearance in winter. Although the Norway are in good condition and making a fair growth each year, they seem to be unable to hold their own with their more beautiful neighbors.

No. 1. White and Norway spruce planted alternately ten feet apart.

No. 2 shows Scotch pine planted a year later. They are large trees, very healthy and provide a good windbreak, but not nearly as attractive nor ornamental as either the white or Norway spruce.

No. 3 shows the balsam fir and European larch planted alternately. In this case also, with one exception, the larch are much the largest trees. All are in good, healthy condition. While the larch loses its foliage in winter, it is a beautiful, symmetrical tree and one of the best trees for ornamental purposes.

All of those trees would saw into barn timbers after thirty-one years of growth and prove conclusively that any of those varieties will yield large profits if grown for lumber purposes; and while they are growing into money as a saw log, they far more than compensate the owner for the money invested and the land they occupy on account of the protection they afford for

buildings and occupants of the farm, as well as live stock, from wind and storms.

The naked trees seen back of the evergreens in photograph No. 1 are Norway poplar about ten years old. They also have grown to be large trees and will soon be ready for the sawmill.

Those trees are planted on various kinds of soil. Some on

No. 2. Scotch pine,

very heavy black soil where the ground is inclined to be wet. Part on clay hillsides, others on a rolling piece of ground that has a thin clay subsoil underlaid with a gravel bed, which shows that these varieties will do well in most any kind of soil that is not too wet.

WILD PARSNIP A DEADLY POISON.—Wild parsnip is not the common garden parsnip that has escaped from cultivation and grown wild. The latter has a more yellowish flower and a tap root. What is commonly called "wild parsnip" is the Wyoming water hemlock (*Cicuta occidentalis*), which greatly resembles the garden parsnip but has a whiter flower, the leaflets finely toothed along the margin, and a cluster of roots.

Every year we have reports of children being poisoned by eating the roots of wild parsnip, and parents will do well to caution their children against touching any wild plant that has an umbrella-shaped top that looks like the garden parsnip.—Colorado Agricultural College.

Raspberry Diseases in Minnesota.

G. R. HOERNER, ASSISTANT IN PLANT PATHOLOGY, UNIVERSITY FARM, ST. PAUL.

Many varieties of raspberries have been brought to a high state of development in this country. Co-ordinately with the development of the host plant, so have raspberry diseases developed. The extent of this development has been such that a thorough study of these diseases, with the end in view of combating their ravages, has become a necessity if the successful growing of this excellent fruit is to continue.

The first federal report on raspberry and loganberry production in the United States in 1899 shows an estimated national planting of 60,916 acres, with a production of 76,628,107 quarts. Minnesota is credited with 1,115 acres and 1,252,930 quarts.

The last available federal statistics, for the year 1909, estimate the national planting at 48,668 acres, with a production of 60,918,196 quarts, at a valuation of $5,132,277. Of this total Minnesota grew 1,388 acres, producing 1,340,469 quarts, at a valuation of $178,689.

For this short period of ten years these figures show a decline in the United States of 12,248 acres devoted to the crop with a consequent decrease in production of 15,709,911 quarts. Estimating the value at the same rate per quart as in 1909, there is a reduction in financial returns of approximately $1,335,342.

Although Minnesota's total acreage and yield increased, there was an actual decrease in production of an average of 158 quarts and a consequent loss of $20.54 per acre.

No later figures being available, it is impossible to state whether the acreage and yield has increased proportionately, whether the yield per acre has been reduced or whether the actual number of acres devoted to this crop is on the decline as a result of the effects of disease.

However, Mr. E. C. Magill, recently of Wayzata High School, in a report on a survey of the raspberry industry in Hennepin county for the past season, states that in four main berry growing districts only one is increasing its acreage. Many fields in the remaining three districts are said to have been already abandoned and others in such poor condition that the plants should be taken out.

A number of varieties have been grown in Minnesota with varying degrees of success, and although weather conditions and poor cultural practices may be responsible for some decrease in yield, failure to recognize the importance and serious nature

of insect pests and plant diseases causes a high percentage of the reduction in quantity and quality of the fruit produced.

The following diseases are the most important in Minnesota,

Gray Bark, or Spur Blight. This is a fungous disease popularly so named because of the visible external effects on canes and spurs. I class it of first importance because of its widespread occurrence, the extent of the damage and, until recently, the slight attention that it has attracted.

The Hopkins, Long Lake, Maple Plain and Excelsior districts, in Hennepin county, are all infested, some fields showing as high as 100% of the canes diseased. The districts about Mankato, Bay Lake and Aitkin are all suffering from the de-

Gray bark, or spur blight, of red raspberries.

structive effects of this disease. It has been reported from Douglas, Pine, Wabasha, Mower, Washington, Renville, Ramsey and Cottonwood counties as well.

Not only has the reduction in yield been great in the last few years, but in many places the effects are so marked that the growers are seriously considering the abandoning of present plantings altogether.

Some growers believe gray bark to be most severe in older plantings or on canes weakened by winter injury. There has not been enough opportunity to collect conclusive evidence on this and other points under our conditions. The effect of winter-killing on various varieties, and the susceptibility of these same varieties to disease, must be investigated. Correspondence on this point with the Experiment Station will doubtless be of mutual benefit to grower and investigator.

The first appearance of the disease, early in July, is characterized by bluish or brownish patches, either at the base of

green canes, or near leaf bases or buds. The fruit-bearing laterals are wilted down, become dry and fall off. Later in the year, beginning about the latter part of August or the first part of September, these bluish areas of the bark become grayish in color, and the outer bark finally cracks and peels off.

The worst features of the disease are, first, the reduction of fruit bearing laterals and, second, the cracking of the bark, allowing loss of water needed for the ripening fruit. A detailed study of the disease is at present in progress. Some varieties seem more subject to the ravages of the disease than others. A partial solution to the problem may lie along the line of varietal resistance. The work at present under way will of course take this question of varietal resistance into consideration. Spraying experiments have been carried on the past season, but data obtained were not extensive or complete enough to warrant very definite conclusions. In Colorado, however, spraying experiments have been financially profitable. It is reported that an increase of 240% of the yield was secured and an increased financial return of about $165.00 per acre. Until more definite recommendations can be given for this state, growers are urged to cut out and burn affected canes immediately after picking is over, and, further, to keep the young canes in the spring well covered with 3-3 or 4-4-50 resin-lye-bordeaux (see foot note) up to the time the berries begin to ripen. A similar spray, should be applied in the fall, after the old and diseased canes have been removed.

Anthracnose.—This is also a fungous disease, extremely common and destructive to black, red and purple berries alike. It affects both canes and leaves.

On the canes ashy gray, sunken areas, with purplish borders, may be formed in great numbers. On leaves and leaf petioles, small gray spots with purple borders are quite common. The effect of this disease is not only to reduce the vitality of the bush generally but causes as well injury to the buds, either by killing them outright or so weakening them that the laterals resulting are either weakened or never mature. Oftentimes the partly formed fruits dry up and drop off. At times the ripe fruit may be damaged.

To control, cut out and burn all affected canes as soon as the picking season is over. Early in the spring when the young canes are but several inches high, one or two applications of 4-4-50 resin-lye-bordeaux mixture usually proves ef-

fective. In planting new areas practice rotation where possible; that is, do not set out new plants on a field that for one or two years previously has grown diseased canes.

Young plants that are set out in new plantings, of course should be absolutely free from disease.

Crown Gall.—This is a bacterial disease which usually attacks the plants thru the soil on the roots or at the crown. Large, irregular, tumor-like growths are produced, usually on the roots, though sometimes on parts above the surface of the ground. All types of berries are affected, tho there seems to be some varietal difference in certain localities. Under all cir-

Anthracnose of raspberries.

cumstances, however, the presence of the disease in any quantity eventually will mean ruin to the productiveness of the planting.

The disease is very common and is spread largely by means of nursery stock. Infected soil may remain so for years. The bacteria causing the trouble may be spread throughout a patch by cultivation. Badly diseased plants are of little value and serve as a center of infection. They should be removed and burned. The greatest precaution should be taken not to set out plants that show any signs of the disease, nor to set out healthy plants on land that has grown diseased plants previously.

Yellows, or Curly Leaf.—This disease, so far as is known, is not caused by a parasite. Heavy, flat soils and the presence of crown gall often cause a yellowing of raspberry plants and are no doubt often mistaken for curly leaf. Close observation, however, will enable one usually to distinguish the true

curly leaf from ordinary, poor conditions in the plants which have a similar appearance. In some districts the disease has been causing considerable damage. The affected plants are usually shorter than the healthy ones. The plant may be very bushy in appearance. The leaves are usually smaller than normal and yellowish in color or mottled, with green and yellow patches alternating. The parts of the leaf between the veins are quite often raised, giving the leaf a peculiar curled appearance. The exact cause of this condition is not known though diseased plants seem to incur in groups in the field. Investigations are being carried on in co-operation with the Horticultural Department to determine whether it is capable of spreading through a field and whether it can be transmitted by the use of cuttings from diseased plants. We do know it affects the gen-

Crown gall of raspberries.

eral vigor of the plants and, consequently, materially reduces the yield.

Raspberry plants should be obtained from localities where the disease is not serious and planted in well drained, not too heavy soil of medium texture. Judicious applications of barnyard manure may be of value. If possible, applications of water during dry weather may be of assistance. If, however, in spite of these precautions, plants show marked signs of the trouble, they should be pulled up at once and burned to prevent a possible infection of nearby healthy plants.

Gray bark, or spur blight, anthracnose, crown gall and yellows, or curly leaf, then comprise the list of the more important diseases of the raspberry in Minnesota.

Investigational work on these diseases is well under way. All of the information which is needed before definite control measures can be prescribed is not yet available. The Section of Plant Pathology of the Department of Agriculture at the University is making a determined effort to get this information. It solicits the co-operation of berry growers. They can render valuable service by reporting diseases, submitting speci-

mens, and giving original observations as to the prevalence of diseases, the damage they cause, and the effect of soil and weather conditions on the seriousness of these diseases, together with the financial losses they occasion.

Information will be sent out as it becomes available. In the meantime it is important to recognize the fact that diseases are important limiting factors in raspberry production and that until more specific recommendations can be made the following procedure is advisable: 1. Set out healthy plants. 2. Practice proper culture. 3. Cut out and burn all infected canes. 4. Spray.

No one method is sufficient, such as spraying alone, without proper regard to destruction of infected material in the field. The importance of this last point cannot be too fully emphasized. In raspberry disease control, as in everything else, an ounce of prevention is worth a pound of cure. Do not wait until your patch is diseased before taking the necessary measures to keep it disease free. Definite action toward complete disease control should be begun immediately.

Mr. Bussey: I would like to know the cause of what we might term leaf riddlers. Along the middle of the summer the upper part of my raspberry bush leaves were riddled like some flies had been at work, but I could not see any traces of flies working.

Mr. Hoerner: I have seen the condition you mention. There may be two things that cause it. If it shows shothole effects, as if the leaves had been punctured with fine shot, it may be caused by a leaf blight. Or it may be a worm that chews very rapidly. It is hard to see, but if you shake the bush you will shake it off. This worm is the larva of a fly—but that is out of my field.

A Member: It is possibly a grasshopper; they will eat most anything.

A Member: Does the root gall affect anything else besides the raspberries?

Mr. Hoerner: Yes, sir. It is true that the same bacteria that causes crown gall on raspberries also affects apple trees and various kind of trees, causing the same kind of a gall on the trees, although it is true that infected galls from the raspberry will affect the raspberries easier than they will affect apples.

Mr. Sauter: Last spring a man to whom I sold some nursery stock showed me some apples that had the same thing as the raspberries.

Mr. Hoerner: It is exactly the same organism, and sometimes you find a hairy root condition on the apple trees caused by the same thing.

Mr. Sauter: What variety of raspberry is more apt to get this kind of disease?

Mr. Hoerner: I would not want to make an exact statement for this reason: the only information we get is from growers, and it may be due to cultural practises.

Mr. Pfeiffer: Are black raspberries more susceptible than the red to these diseases?

Mr. Hoerner: As far as we know, spore blight does not affect the blacks and purples, simply the reds; crown gall affects the blacks as much as the reds, and anthracnose is as apt to be on the black berries as the red.

Mr. Underwood: I think we are more scared than hurt about diseases. It seems to be the province of some people to all the while be climbing hills and crossing bridges and thinking that something is going to happen that is not right. Now, you know we had a great big scare about infantile paralysis this last summer, and they had posted up in our towns that you must not let your children go out on the street, you must keep your children at home and all that, when the facts are that all they needed to do was to take care of their children, feed them right and see that they slept right, that they were well taken care of, and they would not have infantile paraylsis. It was proved that infantile paralysis was not an infectious disease at all, and an eminent physician in New York City said he would undertake to cure a hundred cases of infantile paralysis without any medicine whatever, just by the process of right living. Live right and you will not be sick, take good care of your raspberries, and they will not have any disease.

It is the care of the raspberries that counts, and all this hullabaloo about root gall and hairy root and all that is altogether unnecessary. If you will plant the raspberries, take good care of them, on good land, you will not have any trouble. We grew raspberries until we could not sell them. We had so many raspberries we had to plow them up, we could not get a market for them, and we never thought anything about this disease. We have been at it for years and years. So do not get scared. It tires me to hear the diseases and troubles of life emphasized. We have not any diseases, and we have not any troubles if we just live right. (Applause).

Prof. Stakman: I do not want to start a discussion, but I want to take exception to what has been said. If any are skeptical about the specific nature of these diseases and about their organic causes and the germ theory, I wish they would come and stay with us at the University Farm, and we will undertake to treat them cordially and instruct them about the real nature of disease. What the gentleman has said about the raspberry is absolutely true, and the speaker who has just addressed you has tried to impress that fact, and it is true that the right care would prevent the disease. Any progressive fruit grower in any part of the country where fruit growing is on a com-

mercial basis must take into account that good practice consists in preventing disease. The whole fruit growing community is alert to the problem that if one man lets his orchard run wild or his raspberry patch run wild, it is going to injure all the rest of them.

I do not want you to understand that we are harping on theories, but you talk to a great many fruit growers when the limiting factor in production is disease, and when you prove that that disease can be controlled by very simple methods if intelligently applied, you will have to admit there is something in this. We must take the prevention of disease into consideration as well as the mere culture of the plants.

A Member: I naturally expect any one dealing in diseases and their remedies to talk that, but if we are looking for real things and going up higher we will look for the fruit and the production of them. I think too much of an important feature is being made of disease. I think we ought to look for the fruit and the growth of things.

Prof. Stakman: If the gentleman will undertake to spend a half an hour with me I will show him why it is we are trying to control diseases. The object is not to advocate some pet scheme of our own. We are not interested because we make our living—we hardly make that. The reason we are interested is, it is our duty to do it, and we are interested in the increase in yields. It is a financial proposition with the grower and not for us, and if this gentleman will spend some time with us we will prove it is a financial proposition. I would like to hear from some one who has had actual experience, I do not like this going back to the dark ages.

Mr. Rasmussen: I never had a chance to attend the University, and I had to call them to my place. If it had not been for them I do not think I could have gone very far. They gave me advice as to my irrigation system and as to spraying, and enabled me to save my crops.

Mr. Gust Johnson: I have been around a great deal over this state, and as to this disease it is a fact that it is a disease of the cane, and it is easy to prevent it. All these diseases can be cured or prevented by spraying, no question about it, it has been proved time and again. It is better to cure them than to dig them up and burn them. To dig them up and burn them is like killing a man when he is sick.

Mr. Brackett: There is no question but what we have got to fight diseases. Some years here we could not grow a crop of potatoes unless we killed the potato bug. No man that pretends to raise apples would grow them without spraying them. But I believe with Mr. Underwood that there are a good many bugaboos, that we need not be afraid of, that are put out by people who have an interest in doing so.

Foot note: Full directions for making this resin-lye-bordeaux mixture will be found in Secretary's Corner in this issue.

Strawberries with Irrigation.

N. A. RASMUSSEN, PRES. WIS. STATE HORT. SOCIETY, OSHKOSH, WIS.

I do not think that in a commercial way we can afford to grow strawberries without water. In a small garden on the farm it is easy to get water to them, and in a commercial way you can grow them anywhere if you have water piped to the bed, and it is but a small extra expense if you have a well that supplies the water. We are surrounded by water on all sides, but the only water we can get control of is that down below, and we ought to have it on the strawberry bed.

But before I go on about strawberry culture with irrigation I am going to speak a little on some mistakes we are apt to make. Most any soil will raise strawberries, and it has been said soil that will raise corn will grow strawberries. It will, but it will not grow crops worth while. We should have our land in the best of condition if we expect the best results. Clover sod, with a heavy application of barnyard manure plowed under in the fall or early spring, planted to potatoes or beans, kept thoroughly cultivated and free from weeds, makes an ideal place for strawberries the following year.

In the selection of plants, I think is where we are apt to make mistakes. I think we should select our plants much as the dairyman selects his cows. He takes one cow, perhaps, or a few good cows, as the foundation of his herd; we should take individual plants for the foundation of our strawberry bed. Go into the field soon after planting time, look for the plants that have thrown out extra large, strong fruit stems, with runners not too numerous but large and strong; stake off and take your new plants from there. You will find that some plants will throw out several times as many runners as others; my idea is that the plant that will produce too many runners runs to runners instead of fruit. You may find some that run to fruit and will have practically no runners. We think by thus selecting the plants the strain is improved somewhat.

We grow practically one variety, the Senator Dunlap. I find, however, that they will not do well in all sections, but in most cases where they have been tried they have proved successful. We set the plants with a two horse planter, the same as is used for setting cabbage and tobacco, and find they do far better than when set by hand, and also find this saves a great deal of expense. We set the plants 18 inches apart in the row and four feet between the rows. We cultivate with a

fine tooth cultivator, always using the rolling coulter attached to the side of the cultivator, as this does away with dragging and bunching the runners. It also cuts off the surplus runners, which on our rich land are apt to be very numerous.

One drawback to strawberry culture is the running out of a variety, so to speak. Care should be exercised when digging plants to dig only those showing strong characteristics of the variety and to dig only good, strong, healthy plants. The two greatest troubles, however, are the leaf rollers and the hot, dry

Pumping station in Mr. Rasmussen's garden, supplying piping system for strawberries and celery.

weather, and these ills may both be cured with the same simple treatment.

It costs the average grower about $50 to plant, cultivate and care for an acre of strawberries. I contend this is not sufficient, we should give them better care, and for an additional $25 an acre we can, take it right through, double our crop. Some years we have saved our entire crop by protecting ourselves against leaf rollers, also drought, by watering, using the sprinkler system. The only way we can entirely control the leaf roller is by watering. They seldom start before picking begins, and this is just the time the water should be applied. Four or five days of continued hot, dry weather often ruins a crop or, rather, ends it, while if irrigating is done the season is prolonged to its natural length and the quality of the berries is fine throughout the season.

We pump from an ordinary well, and the pump throws an inch and a quarter stream. First we pumped directly to the field, which worked very well except that it is too hard on the engine and pump. We now use an elevated tank and find that works better. I prefer to have the water come directly from the well rather than have it pumped up and allowed to stand in the tank and grow warm. It is better for irrigating, and the pickers can drink the water, there being faucets all over the patch. We find that the plants like it better; the cooler the water the better they will respond and the more effective it is on insect pests. You can't hurt the plants on a hot day with this water if you do not strike them with a heavy stream but use a sprinkler.

We divide the patch into two sections and run a pipe through the center, placing a bib or faucet about every sixty feet, and then use common garden hose and lawn sprinklers, watering half the patch daily, which is also the part we pick each day.

We plan to water as soon as they have been picked, using just water enough to revive the foliage. An inch and a quarter stream of water for an acre of strawberries is as much as we have had to use in the driest season, and I think we nearly doubled the size of the fruit through the entire season. The last berries, as a rule, are small, but I think with irrigation they are fully as large as the first; at any rate, they are no smaller and usually command a better price.

Mr. Hoyt: How many crops do you pick, and can you keep up with irrigation a continuous picking of crop from your strawberry bed? Will they bear continuously, year after year?

Mr. Rasmussen: We have never had a loss since we have started to irrigate. We planted berries this year, and as we were short of land we grew spinach and radishes between the rows. We pick a bed only one year, and after having been watered the land is in good shape for plowing. We plow immediately after the picking season is over and plant to beans, cabbage or cucumbers.

Mr. Gardner: I did not quite understand your statement of the amount of water you use.

Mr. Rasmussen: We have an inch and a quarter stream pumped with gasoline engine into an elevated tank. This is sufficient for an acre and a quarter of strawberries.

Mr. Gardner: How big is your tank?

Mr. Rasmussen: About thirty barrels.

Mr. Gardner: Would you lay that pipe right along the row?

Mr. Rasmussen: Yes, sir, we lay it right on the ground,

on top of the ground, so that when the strawberry patch is finished we change it to the raspberries or gooseberries.

Mr. Gardner: You have got it so you can shift it easily from one place to the other?

Mr. Rasmussen: Yes.

Mr. Gardner: Have you had any experience with overhead irrigation?

Mr. Rasmussen: I have not. The Skinner overhead system is better and more practical, but it costs considerably more money.

Mr. Kellogg: How many acres have you irrigated from that pump?

Mr. Rasmussen: One acre and a quarter of strawberries and two of raspberries.

Mr. Kellogg: What power is that engine?

Mr. Rasmussen: Horse and a half engine.

Mr. Brackett: In making your plant selections, do you find those individual plants remaining constant in the production of runners?

Mr. Rasmussen: No, sir, but I think I can see improvement in the strain. I do not find as many of the plants that have too many small crowns.

Mr. Brackett: Do you spray?

Mr. Rasmussen: Yes, sir, we spray once with bordeaux mixture when the first blossoms appear.

A Member: How high up is the tank?

Mr. Rasmussen: We have a 25 foot trestle. It is on the highest point of our land. We have to figure to have a twenty foot pressure, anyway.

Mr. Kellogg: How would you work it on ten or twenty acres?

Mr. Rasmussen: You would have to have a better well, to begin with.

Mr. Brackett: Those plants you have then are pedigreed plants you raise from the runners?

Mr. Rasmussen: I do not know how I am going to get the pedigree.

Mr. Brackett: I know of some people who are advertising perigreed plants, and I was at a meeting in which that was discussed. There was a gentleman there who had been in the strawberry business a great many years, and he said he got some of those pedigreed plants and planted them. He also planted some Dunlaps that had been grown in an old orchard and had been neglected for ten or fifteen years, and he took out some of these plants and planted them beside the pedigreed plants, and he couldn't see any difference—and I don't think there is the least difference. A Wealthy apple tree is a Wealthy apple tree anywhere in the United States, because it is the whole tree that Peter Gideon originated. A Dunlap strawberry plant is a part of the first Dunlap that was ever grown. It has been produced by an offset, and it is a part of the

old plant, and I don't believe you can improve it or you can run it out.

Mr. Rasmussen: Go to a dairyman and he might tell you a cow is a cow, but there has been quite an improvement in cows. If you go at it right you can improve strawberries; I advise you to try it and find out the difference.

Mr. Pfaender: I agree with Mr. Brackett, I do not believe that bud selection improves the plants to any appreciable extent. I know that at the Central Experiment Station there were a large amount of Wealthy trees. They took some buds from the best trees and some from the poorest and some medium, and they set out an acre, thirty trees of each class. This orchard is about ten years old, and there is practically no difference in the yield of those three clases.

Mr. Rasmussen: It may be true with the apple, I have not tried it. I do not think I can get anything out of that plant but a Dunlap, but I think I would get a better one.

Mr. Hawley: I would like to ask a question, if you found any difference in plants selected from the main first runner instead of laterals? Are they better and why?

Mr. Rasmussen: I have tried it, but I have never been able to find any difference.

Mr. Hawley: There is a difference in the size of the plant?

Mr. Rasmussen: Yes, sir.

Mr. Hawley: Does not that continue the next year?

Mr. Rasmussen: I do not think so. I like them better to plant, they are nicer to handle, but I do not think you are improving them. They come quicker and are stronger, but I do not think the runners will give you better fruit.

Mr. Hawley: Why do you consider the berries unprofitable after one year?

Mr. Rasmussen: Because I do not think we can get enough; there would be more difference in the yield in an acre of strawberries the second year than the cost of cultivating a new bed? We figure we will never be satisfied with less than $500 gross returns from an acre. We ought to be able to get, like last year, over $1,000. On an old patch I never knew them to run over $350.

Mr. Sauter: Which is your best variety?

Mr. Rasmussen: Dunlap.

Prof. Wellington: Professor Whitten, of Missouri University, had been selecting strawberries for improvement, but his experiments have been negative.

Mr. Rasmussen: We try to improve the strength and growth of the plants, and thereby we get better fruit.

A Member: Have you ever, in sprinkling your berries in the day-time, noticed that the drops of water falling on the flowers would focus the light on the leaves and in that way burn the leaves?

Mr. Rasmussen: Not if you use the spray and leave

it on long enough to cool the plants before you take the water away, but you must leave it there long enough to cool them.

Mrs. Franklin: I want to say that we only have a small patch, about 20x30 feet possibly, of strawberries, and the second year we got over fifty quarts more of strawberries off it than we did the first year? How do you account for that?

Mr. Rasmussen: In the home garden I would not advise replanting every year. You can take care of them in such nice shape that you can keep them three or four years. We are apt to talk too much on the commercial side of it.

Annual Report, 1916, Vice-President, Third Congressional District.

JOHN K. ANDREWS, FARIBAULT.

In this district nearly all fruits excepting strawberries were quite deficient in quality and quantity. Very wet, cold weather in June, followed by a hot, dry July and August, are what our fruit growers attribute this deficiency to.

Of apples we had in most parts a fair crop, but of a poorer quality than usual, excepting where the trees were sprayed.

Plums.—Ranged from nothing to a very light crop.

Cherries.—About the only cherries we raise in this district are the Compass cherries, which bore some this year.

Grapes.—A light crop of good quality.

Blackberries were a decided failure on account of the very hot, dry weather in July and August.

Raspberries.—Reports on these are very uneven, ranging from no crop to a very good one.

Strawberries.—The cool, moist weather in June was very favorable for strawberries, which returned a good yield, No. 1 in quality. Most patches were reported October 15 to be in good condition for 1917.

Not much interest is taken by planters in general about controlling blight or in spraying the orchards. Wherever spraying is practiced the growers seem satisfied that it is the proper thing to do. The difference between sprayed and unsprayed orchards was very marked this year, the unsprayed fruit in many places being worthless.

Our trees and bushes came through last winter in good shape and were ripened up well this fall, but the ground is extremely dry, and it seems very probable that we may have some winter injury to some of our less hardy trees and bushes.

Nursery Legislation in 1917.

F. L. WASHBURN, STATE ENTOMOLOGIST, UNIVERSITY FARM, ST. PAUL.

The amendment to the Horticultural Inspection Law is now a law, passed by the legislature recently adjourned. This enables the entomologist to better combat White Pine Blister Rust and other dangerous insects and plant diseases when occasion arises.

He is also authorized to shut out from Minnesota trees, plants or shrubs from states infested with insects and diseases new to Minnesota.

In virtue of this authority we have just issued the following quarantine notice dealing with White Pine, Stone Pine, Limber Pine and all other five leaf pines.

State of Minnesota

Office of the State Entomologist

Quarantine Notice No. 1 White Pine Blister Rust.

The fact having been determined by the Federal Horticultural Board, the Bureau of Plant Industry and state authorities that a dangerous plant disease, known as White Pine Blister Rust, exists in the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Ohio and Wisconsin, affecting white pine, limber pine, stone pine and all other five leaf pines, and since we are endeavoring to stamp out this disease in the limited area in which we believe it occurs at this time in Minnesota, and since it may be introduced into Minnesota through shipments of nursery stock of the above varieties from infected states, an absolute quarantine is hereby established prohibiting the shipment into Minnesota from the aboye named states of any and all species of five needled pines.

Until further notice the foregoing quarantine shall become and be effective on and after April 30th, 1917.

This quarantine is established under the authority conferred on the State Entomologist by the amendment to Chapter 206, laws of 1913, said amendment having been passed by the State Legislature at its 40th session.

A Business Man's Pleasure in His Peonies.

LEE R. BONNEWITZ, VAN WERT, OHIO.

One of my business associates finding me at work in my peony garden asked with surprise, "Mr. Bonnewitz, why are you doing this kind of work?" And I am sure he did not understand my reply when I said, "My dear sir, I am working in these peonies now so that when I am eighty years old I shall have grown into a happy, likeable old gentlemen. It has taken some observation, and a little of my own home made philosophy, to enable me to realize that success in business will not necessarily bring with it a happy old age, and that he who realizes his connection with God's animate world can be happy at any age."

And so I am realizing pleasure in the culture, care and observation of my peonies, from the first days in early spring, when they so confidently thrust their heads through the earth, until the winter winds call me to lay the ripened stalks as a covering for the new buds for the coming spring.

The real peony enthusiast can see beauty in the plants as they first appear, and I well remember my exclamation of surprise as I one day saw a tiny clod of earth thrown into the air, and saw a peony plant occupy the spot from which the earth had been thrown. That peony had brought its own spring with it.

One of my peony loving friends tells me he can recognize some varieties in his neighbors' gardens just by their appearance as they first greet the light. I have not yet arrived at this efficiency of observation, but he gets a pleasure out of his efforts to correctly name the varieties at this early time in their existence.

I have read of a grower who layered her peonies in the days of early spring, while the stalks were young and pliable, and who succeeded in growing a root upon the bloom stalk at the point where it was covered. It gave me pleasure to try that experiment last spring, and while I did not succeed yet it will give me pleasure to try it again next spring. It is the uncertain things which keeps our interest aroused.

As the buds appear we notice that some of them are round like a ball, some are pointed like a rose bud, and others are flat. One of my friends tells me that "Pleas" varieties have buds which come to a sharper point than any of the English or French varieties. It will be a pleasure for me to see if my observations confirm the truth of his statement. The buds on Kelway's

Queen appeal to me for their particular kind of beauty. If I remember correctly, for nearly a week before the flower opens there are tracings of pink and white in a geometrical pattern which I have noticed on no other bud.

What a pleasure it is for us who live in Ohio to realize that Edulis Superba will not fail us on Decoration Day, for it never has. And how we do wonder whether M. Jules Elie will keep

"Mons Jules Elie" peony and stone bird bath.

faith with us and march in the Decoration Day parade, and make more glorious the resting place of our Nation's heroes.

I always advise my friends who are thinking of planting any peonies to include at least one M. Jules Elie, for I think the growing of this one variety has made more peony enthusiasts than any one other thing in the world. Its beauty can be appreciated more easily than that of any other variety, and its cultivation has seemed to me to serve the purpose of inculcating in the beginner his faith in his own ability to grow fine peonies.

I know at least twenty varieties that I prefer to it now, but it gives me more pleasure to see one of my friends purchase an M. Jules Elie than it does to know of his buying a Therese or a

Lady Alexandria Duff, for I know with the first he is getting the right start, and that he will grow into the desire to own the rarer sorts.

It is a pleasure to own a fine, mature plant of any of the world's best peonies, but it gives me more pleasure to own three, four, or five of a variety, because I can then give each of them individual treatment, and I can see how each one responds to the treatment given.

It was a pleasure to see some wonderful Jubilees develop in my own and in my neighbor's gardens, and to suddenly make up my mind to show those peonies at the New York show last June. It was a pleasure to meet other amateur peony growers at the show, and to become acquainted with the professional growers who attended the business meeting of the society.

I do not need to tell you of the pleasure I had in seeing and studying the hundreds of varieties which were staged in the show, for I suppose at no other place in the world could so many different varieties be seen in one day. It was a pleasure to see that some of the very best flowers were exhibited by amateurs, and it was delightful to see how each amateur's face glowed with pleasure as his flowers excited favorable comment. I liked to listen to each one of them as he told me of his garden and his favorite peony.

It was a pleasure to find some of my flowers among the prize winners, and to make up my mind to strive for a place among the prize winners next year. But the greatest pleasure of the whole show was the delightful friendships formed through our mutual interest in this lovely flower and the fact that these friendships have been cultivated through correspondence in the ensuing months. We look forward with great pleasure to the next peony show, for we have promised to meet the same friends and hope to make other new and lasting friendships.

Returning home is always a pleasure, but this return was particularly enjoyable, for I gave three extra days to it so I could visit the peonies at The Cottage Gardens, Queens, Long Island, and also Mr. Farr's peonies at Wyonising, Pa. These two great peony fields were revelations to me, and it was a great satisfaction to meet the expert growers who are responsible for the correct cultivation and selection of varieties. They gave their time to me willingly, and I tried to express my appreciation, for a visit to these extensive fields under the guidance of the grower is a long step in peony education.

Each one of you know my pleasure on my return to my own garden, for you experience the same pleasure when you return to your gardens. When I left my garden was beautiful with the early varieties; on my return it was the later varieties which made me glad that I possessed a garden of my own. Maud L. Richardson and Enchanteresse were appreciated not only for their beauty, which causes me to class them as extra high grade

A vase of "Jubilee" peonies.

varieties, but also because they added an extra week to the peony season.

One Thursday in June, it pleased me to get a letter from my St. Paul friend and peony lover, Mr. D. W. C. Ruff, telling me how fine his peonies were blooming, and the following morning, while working in my own garden, the thought suddenly came to me, that it would be delightful to see the famous peonies of the great northwest. It took but a moment to begin to put the thought into action, and in less than three hours I was on my way to the Twin Cities, and Saturday morning found me in the most beautiful peony garden I had ever seen. LeCygne, La-France, Solange, LaLoraine, Alsace Loraine, Sarah Bernhardt, Madam Jules Dessert, Therese, Rosa Bonheur, Primevere, Mont

Blanc, Mignon, M. Martin Cahuzac, Evangeline, and dozens of others of the world's finest varieties were blooming as I had never seen them before. I was so delighted with Mr. Ruff's garden that I spent two days in it, and I really wanted to stay a week.

Monday found me in Faribault, and although I did not get to meet Mr. Brand, I was delighted to find his wonderful Elizabeth Barrett Browning, and his splendid Mary Brand. His Martha Bulloch was a wonder in size, but the charm of E. B. Browning leads me to believe it will be recognized as one of the world's great peonies. It gives me great pleasure that all three of these varieties have a home in my garden, and if they blossom in Ohio as they do in Minnesota it will be a pleasure to exhibit them in our Eastern shows.

It is no doubt a wise arrangement which prohibits an amateur peony grower from selling roots, but in my case it has given me great pleasure to give them away, and in some cases I find an added pleasure in planting connected with my love for peonies The greatest of all pleasures connected with my love for peonies is to find that my friends are learning to appreciate and love them too. There are certain friends I meet every week, and we always talk about our peonies. I am glad to see them, and I feel sure they are just as glad to meet me and to talk the latest peony news.

I occasionally meet flower lovers who have not yet learned what a wonderful flower the peony is. A root of an extra fine variety sent to them postpaid at the right time, with proper planting instructions, not only makes a new peony enthusiast but strengthens our friendship. It has many times given me pleasure to send a root of a rare and fine sort to some other enthusiast of whom I have heard, and it will be a great pleasure at some time to have his opinion of my peony.

Not the least of my peony pleasures comes when I am dividing some particularly fine plant to find that I can make three, four, five or a dozen plants where I only had one. It seems I have only begun to tell you of the pleasures of a single peony season, for I have not told them all by any means, but I realize you have more important things to discuss than peony pleasures, and so I will close with a reference to the pleasure I find in many growers' well written peony catalogues. This kind of a pleasure is available fifty-two weeks in a year, and while it is true I have a fair library for a business man I have no books which are more often in my hands than the catalogues of the well known peony growers of the United States, and of Europe.

Peony pleasures are health giving, life giving, love giving pleasures, which not only broaden our views of life and happiness but also give us length of days.

Secretary's Financial Report, 1916.

A. W. LATHAM, SECRETARY.

DISBURSEMENTS.

Postage	$714.51
Office rent	420.00
Telephone	49.23
Premium books	81.83
Office supplies	25.00
Plant premiums	168.06
Assistance in office	757.75
Printing	417.44
Expenses annual meeting, 1915	566.75
Expenses annual meeting, 1916	16.15
Expenses summer meeting, 1917	29.55
Banquet 1916	221.00
Reporting annual meeting, 1915	145.00
Expenses, vice-presidents	6.05
Expenses, superintendents trial stations	30.72
Expenses, delegates, etc., 1916	145.87
Assistant librarian	20.00
Discounts on memberships in 1916	722.30
Discounts on memberships in 1917	49.30
Examining officers' books	10.00
Collecting checks	5.40
Library	49.05
Hennepin County Savings Bank	900.00
Treasurer's salary, 1915	25.00
Expenses, executive board	6.00
Minnesota Forestry Association	53.25
Sundries	30.57
Balance	413.71
	$6,079.49

RECEIPTS.

Balance	$112.13
G. W. Strand, Treasurer	800.00
Life membership fees	300.00
Books sold	24.50
Cuts sold	21.21
Banquet tickets sold at $1.00 each	174.00
Garden Flower Society, account of premiums	65.00
Annual membership fees for 1915	32.00
Annual membership fees for 1916	3,193.00
Annual membership fees for 1917	315.00
Apples sold, annual meeting, 1916	33.75
Hennepin Co. Savings Bank, drawn out in 1916	750.00
Hennepin Co. Savings Bank, drawn out in 1914	200.00
Plant premiums	51.00
Sundries	7.90
	$6,079.49

GENERAL STATEMENT, DECEMBER 1, 1916.

Balance in Hennepin County Bank, savings acct., Dec. 1, 1915....	$188.62
Deposited in Hennepin County Bank in 1916.....	900.00
Interest in 1916.....	20.78
	$1,109.40
Drawn out in 1916.....	750.00
Balance in savings account.....	$359.40
Loring Fund, including interest.....	146.29
Balance in Secretary's account.....	413.71
Balance with Treasurer.....	4,705.09
Total	$5,624.49

Annual Report of Treasurer, 1916.

GEO. W. STRAND, TAYLORS FALLS, TREAS.

RECEIPTS.

1915.		
Dec. 1.	Balance on hand.....	$4,906.00
Dec. 1.	Farmers Mechanics Bank, interest to October 1st.....	85.94
1916.		
Feb. 23.	Semi-annual allowance, State Treas.....	1,500.00
June 22.	A. W. Latham, receipts 11/30/15 to 6/15/16.....	4,112.82
Aug. 29.	Semi-annual allowance, State Treas.....	1,500.00
Oct. 1.	Farmers & Mechanics Bank, interest to date.....	160.90
Dec. 1.	A. W. Latham, Secy., receipts 6/15/16 to 11/29/16....	623.48
		$13,889.14

DISBURSEMENTS.

1915.		
Dec. 17.	Order 245, Premiums Annual Meeting, 1915.....	$604.00
1916.		
Jan. 3.	Order 238, A. W. Latham, revolving fund.....	800.00
Mar. 1.	Order 239, A. W. Latham, first quarter salary.....	450.00
June 3.	Order 240, A. W. Latham, second quarter salary.....	450.00
June 22.	Order 241, A. W. Latham, exp. secy. office 11/30/15 to 6/15/16	4,112.82
July 1.	Order 244, Premiums Summer Meeting.....	178.75
July 1.	Order 242, Minnesota State Forestry Association....	65.00
Sept. 1.	Order 243, A. W. Latham, third quarter salary.....	450.00
Dec. 4.	Order 246, A. W. Latham, fourth quarter salary.....	450.00
Dec. 1.	Order 247, A. W. Latham, Secy., exp. 6/15/16 to 11/29/16	623.48
	Balance on hand.....	4,705.09
		$13,889.14

STATEMENT OF DEPOSITS.

Security National Bank (open account).....	$582.10
Farmers & Mechanics Bank (savings account).....	4,122.99
	$4,705.09

Canning Fruits and Vegetables.

R. S. MACKINTOSH, AGRICULTURAL EXTENSION DIVISION, UNIVERSITY OF MINNESOTA.

In all well managed gardens there should be enough fresh vegetables to supply the table during the summer and to can for winter use. It is true that carrots, beets and similar vegetables can be harvested in the fall and stored in cool cellars, but they are often woody and are not so palatable as they are earlier in the season. Vegetables should be fresh and crisp when canned.

Under modern methods it is comparatively easy to preserve a supply of vegetables. The simplest and best way of canning vegetables is known as the cold pack method. This means that the material is properly prepared and washed, then blanched in steam or boiling water and immediately cooled in cold water. The heat shrinks the material, while the cold bath hardens the tissue and sets the color. The product is packed in jars or cans while cold; hence the name, *cold pack.* Salt is added to each quart and the jar filled with boiling water. The best quality of rubbers should be used. The covers are put in place, tightened enough to prevent contents running out when turned upside down but permitting bubbles of air to escape in heating, and the jars put into the cooker and heated. The length of time required for the different vegetables is given in the table. The final heating of the vegetable and the sterilizing of the jar, rubber, cover and product are done at one operation. This process eliminates the use of any canning powders or preservatives and is easy, simple and safe. It is the method used by the boys and girls in the nationwide canning work under the leadership of the United States Department of Agriculture and state colleges of agriculture.

Equipment.

There are three kinds of equipment in use which, for convenience, may be grouped under three heads: (1) Homemade, commonly called hot water bath outfits, as pails and washboilers provided with a false bottom to keep the jars away from the fire. (2) Waterseal outfits, in which one or two covers are used to aid in maintaining a higher temperature. (3) Steam pressure outfits, which raise the temperature considerably above the boiling point.

The homemade outfits are fairly satisfactory but require considerably more time properly to sterilize the material. It is a good plan to practice with a homemade outfit before buying a commercial one. In all outfits it is necessary to have a false bottom, at least one inch above the bottom of the vessel, to prevent the glass jars from breaking and to permit the water to circulate freely. Metal racks are best because they do not float. Wood can be used if weighted or held in place in some way. The water seal and steam pressure outfits are made especially for the purpose and require less time than the homemade. Thousands of these canners are in use, and there is no reason to doubt their practical value. In selecting an outfit, care should be taken to get one that is satisfactory in every way. Do not depend entirely on descriptions furnished by the manufacturers.

The time required for sterilizing the various vegetables is as follows:

Vegetable—	Hotwater Bath Outfit.	Water-seal Outfit.	Steam Pressure Outfit.*
Spinach, beet tops, Swiss chard and other greens.	90	60	50
Carrots, beets and other roots and tubers	90	75	60
Tomatoes	22	18	15
Corn	180	90	60
String beans and peas	120	90	60
Pumpkin and squash	60	45	35

*Five pounds pressure.

Cold Pack Method.

The three distinct steps to be observed in the cold pack method should be kept clearly in mind: (1) blanching; (2) cold dipping; and (3) final cooking or sterilizing.

Blanching is the preliminary heating to reduce its bulk or shrink it.

Cold dipping means that after the product is blanched it should be dipped into cold water.This hardens the tissue, loosens the skin, helps to prevent the loss of coloring matter in the final heating, aids in killing any bacteria which may be on the product and makes the material easier to handle in filling the jars or cans.

Sterilizing, or final heating, of the product in the jar or can must be sufficient to kill all forms of bacteria. The time required depends on the vegetable to be preserved.

Recipes*

Greens—Swiss Chard, Spinach, Beet and Turnip Tops and Asparagus.—Can the day gathered. Sort and clean, blanch from 15 to 20 minutes in a vessel with a little water under the false bottom. Remove and plunge at once into cold water. Cut into convenient lengths and pack tight in jars. Add one level teaspoonful of salt to each quart, and add boiling water, if necessary, to fill the jar. Put on rubber and cover. Partially tighten cover. Sterilize 90 minutes in open kettle, 60 minutes in water seal, or 50 minutes under five pounds pressure in steam pressure outfit. Remove from canner, tighten covers, invert to cool and to test joints, and store in cool, dark place.

Cabbage, Cauliflower, Kohl-rabi and Brussels Sprouts.—Wash thoroughly and cut into small pieces. Blanch from three to ten minutes. (Cauliflower is very tender, so need not be blanched more than three or four minutes.) Put into cold brine 12 hours. Pack in glass jars or enameled tin cans, add one level teaspoonful of salt to each quart. Fill jars with boiling water. Put rubber and cap in place but do not tighten. Sterilize the same as greens. Remove jars, tighten covers, and invert to cool and to test joints.

Carrots, Beets, Turnips and Other Roots and Tubers.—Can the day gathered. Grade by size and color. Wash thoroughly. Scald in boiling water long enough to loosen skin. Plunge at once into cold water. Remove skin. Put into jars, either whole or cut. Add one level teaspoonful of salt

*Adapted from Circular NR-24, U. S. Dept. of Agr., "Home Canning Club Instructions to Save Fruit and Vegetable Waste."

to each quart and fill the jar with boiling water. Put on rubber and cover. Partially tighten cover. Sterilize 90 minutes in open kettle, 75 minutes in water seal, or 60 minutes under five pounds pressure in steam pressure outfit. Remove from canner, tighten cover, invert to cool and to test joints, and store in a cool, dark place.

RHUBARB.—Wash stalks clean and cut into pieces three-fourths of an inch in length. (Do not remove skin.) Blanch two minutes, dip in cold water, and pack in glass jars. Pour on thick syrup, boiling. Put rubber and cap in position, but do not tighten. Sterilize 20 minutes in open kettle, or 15 minutes in water seal or steam pressure outfit. Remove jars, tighten cover and invert to cool and to test joints. Wrap jars with paper to prevent bleaching.

STRING AND LIMA BEANS, PEAS AND SIMILAR VEGETABLES.—Can same day as gathered to prevent souring. Clean and grade. Blanch in hot water from two to five minutes. Remove and plunge at once into cold water. Pack in jars. Add one level teaspoonful of salt to each quart and water to fill jar. Put rubber and cover in place. Partially tighten cover. Sterilize 120 minutes in open kettle, 90 minutes in water seal and 60 minutes under five pounds pressure in steam pressure outfit. Remove jars, invert to cool and to test joints, and store in a cool, dark place.

TOMATOES.—Grade for size, ripeness and color. Scald in hot water to loosen skin. Pack whole. Add one level teaspoonful of salt to each quart. Put rubber and cover in place. Partly tighten cover. Sterilize 22 minutes in open kettle, 18 minutes in water seal, or 15 minutes under five pounds pressure in steam pressure outfit. Remove jars, tighten covers, invert to cool and to test joints, and store in dark, cool place.

CORN.—Can same day as picked. Remove husks and silk. Blanch on cob in boiling water from 5 to 15 minutes. Plunge at once into cold water. Cut the corn from the cob with a sharp knife. Pack tightly in jars. Add one level teaspoonful of salt to each quart and fill with boiling water. Put rubber and cover in place. Partly tighten cover. Sterilize 180 minutes in open kettle, 90 minutes in water bath, or 60 minutes under five pounds pressure in a steam pressure outfit. Remove jars, tighten covers, invert to cool and to test joints, and store in a cool, dark place.

PUMPKIN AND SQUASH.—Cut into convenient sized pieces, remove seeds and skin. Cook 30 minutes to reduce to pulp. Pack in jar, add one level teaspoonful of salt to each quart of pulp. For pies add one cup of sugar to each quart. Put rubber and cover in position. Partly tighten cover. Sterilize 60 minutes in open kettle, 45 minutes in water seal or 35 minutes under five pounds pressure in steam pressure outfit. Remove, tighten cover, invert to cool and to test joints, and store in a cool, dark place.

STRAWBERRIES.

Recipe 1.—Can fresh, sound berries the same day they are picked. Hull (twist berries off hull) and place in a strainer. Pour water over the berries to cleanse. Pack them in a jar without crushing. Pour hot syrup (two pounds of sugar to one quart of water) over the berries to the top of the jar. Put the rubber and cap in position, not tight.

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.
Water bath, homemade or commercial	8
Water seal at 214 degrees	6
Steam pressure 5 pounds	6
Steam pressure 15 pounds	4

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

Recipe 2.—Berries canned by this recipe will not rise to the top of the syrup. Use only fresh, ripe, firm and sound berries. Prepare the berries. Add eight ounces of sugar and two tablespoonfuls of water to each quart of berries. Boil slowly for 15 minutes in an enameled or acid proof kettle. Allow the berries to cool and remain over night in the covered kettle. Pack the cold berries in sterilized glass jars. Put the rubber and cap in position, not tight.

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.
Water bath, homemade or commercial	5
Water seal 214 degrees	5
Steam pressure 5 pounds	4
Steam pressure 15 pounds	4

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

Pineapple.

Use sound, ripe fruit. Prepare, peel and core it. Remove all eyes. Cut the fruit into convenient cross sections and blanch it three minutes. Cold dip the fruit. Pack it in glass jars or enameled tin cans. Pour on thin or medium syrup (six pounds of sugar to nine quarts of water). Put the rubber and cap in position, not tight.

Sterilize the length of time given below for the particular type of outfit used.

	Minutes.
Water bath, homemade or commercial	20
Water seal 214 degrees	15
Steam pressure 5 pounds	10
Steam pressure 15 pounds	8

Remove the jars. Tighten the covers. Invert the jars to cool and test the joint. Wrap the jars with paper to prevent bleaching.

Common Canning Difficulties*

Canned corn, peas, beans and asparagus may show no signs of spoilage and still have a sour taste and disagreeable odor. This is known to the canner as "flat-sour," and can be avoided if the product to be canned has not been gathered more than five or six hours before canning. Blanch, dip in cold water, and pack one jar at a time. Place each jar in the canner as it is packed. A little extra cooking will not affect the product. When the steam pressure outfit is used the jars or cans may be placed in the retort and the cover put in position but not clamped down until the retort is filled. Rapid cooling prevents overcooking, clarifies the liquid, and preserves the shape and texture.

Corn gives the canner most trouble, but with a little care and study it may be canned as easily as any other vegetable. The corn should be just between the milk and dough stage. Blanch not longer than five minutes, then plunge into cold water. Cut the corn from the cob with a sharp knife and pack at once in sterilized jars. Best results can be secured when two persons cut and one fills. If it is necessary for one person to work alone, cut off sufficient corn to fill one jar, pour on boiling water, add salt, place rubber and cap in position and put the jar at once in the canner. Corn should not be tightly packed in the jar as it expands a little in processing.

*Adapted from Circular NR-29, U. S. Dept. of Agr., "Common Home Canning Difficulties."

Corn should never be allowed to remain in the cold dip, and large quantities should not be dipped at one time unless sufficient help is available to handle the product quickly.

Faded Beets.—When preparing the beets leave on four inches of stem and all of the tail while blanching. Blanch not more than five minutes and dip in cold water. The skin should be scraped from the beet, not peeled. The beets should be packed whole if possible.

Mold on Canned Goods.

Mold may develop on canned goods

1. If the seal is defective.
2. If, after sterilizing, tops are removed from jars to replace rubber ring. If this must be done, the jars should be returned to the canner for at least five minutes.
3. If jars are kept in a damp place where the rubbers may decompose.

Operation of Hot Water Bath Outfit.

Four rules will help in the operation of the hot water bath canning outfit:

1. Support the jars on a perforated platform high enough to allow the water to circulate under, among and around the jars.
2. Have the water cover the tops of the jars by at least one inch.
3. Count time as soon as the water begins to *jump* over the entire surface.
4. Remove the jars from the water and tighten covers as soon as time is up.

When a hot water bath outfit is used loss of liquid during the sterilizing period will result:

1. If the water in the canner does not cover the tops of the jars.
2. If the platform in the bottom of the canner does not permit the water to circulate underneath. Towels, excelsior, newspapers, hay and the like are unsatisfactory.
3. If the covers to the jars are adjusted too loosely.

Rubbers.

A good rubber will stand considerable pulling and will return to its original shape. A good rubber will also stand several hours of boiling in a hot water bath outfit without being affected.

Breakage of Jars.

When jars break it is usually owing to such causes as:

1. Overpacking. Corn, pumpkin, peas, lima beans and sweet potatoes expand in processing, so the jars should not be quite full.
2. Putting cold jars in hot water or vica versa.
3. Having the wire bail of glass top jars too tight.
4. In steam canner having too much water in the canner. Water should not come above the platform.
5. Allowing a cold draft to strike the jars when they are removed from the canner.

Tests for Jars.

The following are valuable tests:

For screw top jars

1. Put top on jar without the rubber. Turn down tight. If the thumb nail can be inserted between top and glass, the top is usually defective.
2. Put rubber and cap in position and screw down lightly. Pull rubber from position. Release. If the rubber returns to position between top and jar, the top is defective.

For glass top jars

1. Put top on jar without rubber. Tap with finger around the outer edge of the top. If the top rocks it is defective.
2. The wire bail placed over the top of the cover should go in with a snap even when tightening lever or clamp spring is up. If it does not, remove bail from tightening lever and bend to make tight.

N. W. PEONY AND IRIS SOCIETY.

W. F. CHRISTMAN, Secretary.
3804 Fifth Avenue South, Minneapolis. Minn.

Our 1917 peony and iris show will be held in conjunction with the Minnesota State Horticultural Society and the Garden Society flower show. Full particulars as to date and directions for reaching the exhibit will be found in this issue of the Horticulturist.

Don't fail to read Mr. Bonnewitz's very able paper which appears in full in this issue. Mr. Bonnewitz has 288 varieties of peonies in his garden. We want you to meet him at the June meeting.

Your Secretary has the assurance of several members located outside of the state who expect to be with us at our June meeting. We will gladly welcome them and hope to be able to have a good exhibition on display.

Don't fail to disbud in order to get the best bloom for exhibition purposes. Thoroughly cultivate, exercising care not to work too close to the plant and cause injury to the roots.

A committee on the peony and also one on the iris is preparing a list of 100 varieties of each sort that the society can unqualifiedly recommend as being desirable. It is the purpose to include only those varieties that have proven their worth from year to year in the various localities under adverse as well as favorable conditions. We are in hopes to have these lists compiled in time so the matter may be brought before our June meeting.

Some time ago I sent out the following questions to a number of our members:

(1) Have you experienced any difficulty with the growing of peonies or iris?

(2) If so, does it relate to disease or diseases of the plant or of the flower?

(3) Describe the disease and state when it starts, its progress and effects.

(4) What remedies have you applied and with what success?

The following reply was received from Mr. James Boyd of Philadelphia, Pa., one of our members. Mr. Boyd has a splendid collection and his experience will doubtless be valuable to our readers. I quote his answers below.

(1) "Yes, I have experienced difficulties in growing peonies, particularly during the last two or three years. Before that time I thought the peony one of the easiest plants in the world to grow successfully.

(2) "My plants have suffered mostly from what I call 'root disease,' or 'black rot.' The buds do not develop but become hard and brown and sometimes shrivel up. Here and there a stem will wilt completely and has to be cut off. The wilting of the stem generally takes place after blooming time and is almost a sure indication of root disease.

(3) "When the plant is dug up, I find the part of the root from whence the withered branch was cut to have a black decay that extends down into the root. This seems to always start from the point where the wilted stem grew and sometimes will extend throughout a root that on first inspection appeared to be perfectly healthy.

(4) "I dig out, cut and scrape cleanly, all the diseased parts. I then wash the root thoroughly and dip it into a pail of Bordeaux mixture. The plants which I treated this way in 1915 look very well this year. I dug up several in order to examine them, and with the exception of one, possibly two, the disease seemed to have been stopped and the plants were making healthy growth.

"A friend recommended using a 5% solution of formaldehyde. I tried this on several points which I was treating early in the season, giving them a dip in a bucket containing this 5% solution, after all of the black rot had been removed with a knife. I dug these plants up recently and looked at them and found a sort of bluish, fuzzy mould on them, which I did not like the appearance of. Perhaps it was harmless and would not interfere with the growth of the plants, but I decided to return to the Bordeaux mixture, which seemed to be giving good results.

"Last spring I had a number of plants throw up crooked and deformed stalks. In some cases, some of the stalks would be extremely large, crooked and irregular, while others from the same plant would be thin and of irregular size. Some plants affected in this way bore two or three enormous flowers on short stems, while the rest of the bloom from the same plant was small or deformed. I had never had this trouble before and attributed it to too much bone meal and ashes, or the use of these two fertilizers in conjunction. I withheld all further fertilizers from them during the season, cultivating the ground thoroughly, and applied a little lime. Most of the plants seemed to recover and became normal before the end of the season. In some instances, I dug up the roots and found them perfectly healthy.

"The root disease which I have mentioned above, I have found very prevalent in plants which I have imported from England and France, particularly in those from England. In some sections of this country it seems to be little known, while in other sections it has proven to be a great nuisance. The actual losses or deaths of plants from this disease have been very few with me, possibly because I have learned to look for it on appearance of first symptoms."—Jas. Boyd.

I consider the information contained in Mr. Boyd's letter very valuable indeed and would be pleased to hear from other members who may have experienced trouble with their peonies or iris. Even though your plants are perfectly healthy, we want to be prepared for any contingency that might arise, and by the exchange of experiences we will broaden our knowledge and increase our efficiency, thereby enabling us to handle intelligently and properly any diseased condition of our plants.

BEE-KEEPER'S COLUMN.

Conducted by FRANCIS JAGER, Professor of Apiculture, University Farm, St. Paul.

AN OPEN LETTER TO MINNESOTA BEEKEEPERS.

To meet the extreme situation facing the country of the high prices and shortage of foods the United States Government has issued a call for increased production and better distribution of all food materials. The present 10% shortage in the sugar supply is conservatively estimated to be 30% or more by July 1, 1917. It is therefore urged that honey production be raised to its greatest capacity and efficiency. Not only will this increased supply of honey materially help to meet the sugar shortage, but it will bring honey into actual general use among the public with beneficially healthful results. Incidentally of course the beekeepers themselves will profit from increased honey production in this and following years, as the wholesale price of honey, formerly 8½ and 9 cents per pound, is now 11 and 12 cents, and there seems to be none obtainable anywhere in the United States at the present time. The nation's need, an open market and good prices, present an opportunity for the beekeepers.

To meet the call of the Government and bring honey production to a greater capacity and efficiency, organization and cooperation among the beekeepers is very desirable. With this in mind it is strongly urged that wherever possible for four or five or more beekeepers to get together, a local or county club or association be formed conveniently located in the county, to become a branch of the Minnesota Bee Keepers' Association and hold local meetings every two weeks or so in May and June at least, where papers on present best methods of swarm control, honey production, marketing, etc., may be discussed with field meetings and demonstrations in beeyards the same day whenever possible.

It is planned to somewhat decrease for the immediate present the amount of beekeeping work at University Farm and help Minnesota beekeepers in this work of organization, meetings, papers, discussions, field meetings and demonstrations, bringing as much as possible to the beekeepers the present best methods of swarm control, honey production, marketing, etc.

Every beekeeper is requested to get in touch with all possible local and county beekeepers immediately, the day this number of the Horticulturist is received if possible, choose a chairman and secretary and decide when and where in your county the first meeting of the organization will be held, advertise it well with notices, etc., in all the local papers, write to us for sample organization plans, papers, etc., and if possible someone from University Farm will be present, and probably also a representative from the State Beekeepers' Association.

As the winter losses the past winter for Minnesota are very heavy our best efforts are needed to meet the present situation.

May we hear from you as soon as convenient?

GINSENG COLUMN.

Conducted by F. C. Erkel, Rockford, Minn., Secretary Minnesota Ginseng Growers' Association.

At the tenth annual meeting of the Minnesota Ginseng Growers Association, held at West Hotel at same time of the Horticulturists' annual meeting, it was decided to become affiliated with that Society.

The attendance was about normal but an unusual amount of enthusiasm was manifested on account of the importance of the principal topic to be discussed, that is, the marketing problem.

There has been an unlimited and steady demand for all the ginseng ever produced in the United States to supply the Chinese market, in which country ginseng has been in use for centuries and is considered a panacea for all the diseases the four hundred million or more Chinese fall heir to.

By reports from China and from statistics furnished by the U. S. Revenue Department we learn there has been a steady increase in the value of ginseng roots. The average price per pound in 1858 as declared at the U. S. Revenue office was 52 cents per pound, while the average for the fiscal year ending June 30, 1915, as given by the same authority, was $8.91 per pound.

Regardless of this steady increase in value the growers have for the past few years been compelled to accept less than half the amount that buyers paid them for the same quality roots three or four years ago.

It is a well known fact that the cultivation as well as the sale of ginseng in Manchuria is a government monopoly and that a trust handles the entire product for the government. It is quite evident this Oriental trust is having something to do about dictating the price to be paid growers of American ginseng.

On November 1st a meeting was held in Chicago, with delegates from practically all the ginseng growing districts in the United States, for the purpose of organizing an American Ginseng Growers' Association to look after marketing the million dollars worth of ginseng produced annually in this country.

A co-operative selling organization was formed, and it is proposed to establish headquarters in New York and give the buyers every opportunity to do the square thing, and if they refuse to do this it is proposed to establish a permanent selling depot in Hong Kong.

Practically every member of the Minnesota Ginseng Growers' Association present who has any roots to market at the present time or expects to have within five years took stock in this National Selling Association, and if the same enthusiasm is manifested throughout the United States among ginseng growers it will be an easy matter for the growers to control the sale of their million dollar crop through this co-operative selling association.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So. Minneapolis.

ROCK GARDENS.

England probably has the most wonderful rock gardens, for the people have utilized their naturally stony ground to the fullest extent and have some gorgeous effects as a result. Our own New England, with its boulders and rocks of all kinds, has for years been trying, at great expense, to blast and break and dig them out and to make in their place formal lawns, when the natural beauty of the surroundings could so easily have been maintained by the informal planting of their rocky ground. They too have found this out and are producing some beautiful rock gardens. Most of us have some spot that simply will not conform to our idea of beauty, and perhaps a rock garden there might solve the vexing problem.

Of course the most desirable rock gardens are the natural ones. I have in mind two spots in neighboring places where I long to make such a garden. One is a little cove with huge rocks deeply imbedded in a tiny spring, with a group of three immense trees at the head, a most ideal place for a rock garden. The other is a fascinating little stream flowing in a winding manner through a broad expanse of meadow land. An uneven rocky border would wonderfully transform the spot.

Beautiful artificial rock gardens can be made with very little trouble or expense by selecting rough field stones, the flatter the better, and sinking one-third of the rock in the ground to insure a firm foundation. The spot should be slightly sloping, not too shady and without hollows, as Alpines cannot stand stagnant moisture. Leave the cracks and crevices for the Alpines to grow deep in and for the moss to creep in.

Do not let your garden begin nor end too abruptly; lead up gradually to it by the use of odd shaped rocks, as an approach to the garden proper. The simplest rule is to follow nature as much as possible.

There are many styles of rock gardens to follow, but the conditions on your place must guide your selection. A pleasing form is the wall garden, used wherever a bank or retaining wall is needed. No mortar is used as that hinders the very effect desired, that of the flowers growing in and out of the fissures and cracks. In laying each stone keep a backward, downward slope for drainage. A hollow tile may be inserted to form a little waterfall.

Another style of rock garden is the border garden. This is the foreground for a formal or informal border and should be one-sixth the width of the border itself. Thus if you have a twelve-foot border planned, use two feet of it for a rock border. Lay the stones very irregularly and plant with flowers of varying heights, to keep the irregularity. A charming effect can be made where one has a terrace, by making uneven steps, wide enough for use as such, and planted with low growing Alpines, vines and moss.

Rock gardens may also surround water gardens and bog gardens, by the use of flat rocks as an irregular outline, rather than the straight cement edges more often used.

Pathways may be made into rock gardens by using broken pieces of cement sidewalks or very flat rocks sunk in the ground in a very hit or miss pattern and planted with low growing Alpines.

There are two kinds of rock garden plants, Alpines and rock plants. Alpines, as the name implies, grow in the Alps, while rock plants include Alpines and also plants from all parts of the temperate zones which are suitable for rock gardens. The literature on this subject groups all rock loving plants as Alpines, since many of the real Alpines grow in our own woods and on the mountains of our own country.

Perennials and self-sowing annuals are used in planting rock gardens. Avoid anything that gives the effect of excessive work or expense.

Small evergreen trees, shrubs and vines, as well as moss, give the effect of age, which is so desirable in rock gardens. Pitch pine trees, daphne

cneorum, or garland flower, Virginia creeper, bittersweet, wild clematis, Kenilworth ivy and wall pepper are most suitable for this purpose.

For rocky woodland use dog tooth violets and all other varieties of violets, hypatica, maiden hair ferns, spring beauty, bloodroots, bluebells and wild crane's bill.

For rocks exposed to full sunshine use dwarf irises, columbines, allyssum, saxifraga and sedums. For tall Alpines use columbines, St. Bernard's lily, bush clematis, bee larkspur, foxglove and saxifraga.

The dwarf Alpines offer the following varieties: hypatica, wood anemone, snowdrop, windflower, gentian, harebells, Alpine asters, forgetmenots, Iceland poppies and lily of the valley.

Hardy perennials usually classed as Alpines but suitable for rock gardens offer the following choice: phloxes, especially the creeping phlox, Shasta daisy, spireas of all kinds, primroses, stone crop, or sedums, portulaca and rock cress. Alyssums are very popular, as are the dainty gypsophila and the little scilla bifolia, which often peeps through the snow to remind us of the approach of the longed for spring.

There are many more, but time will not permit mentioning them. With such a wide range to choose from one can have a charming garden with as little or as much expense as desired, and, having once planted it, just keep it free from weeds, and it will be a "thing of beauty and a joy forever."

There is a delightful zest in trying new things, or, since there is no new thing under the sun, in trying new ways of doing old things, so I prophesy a run on rock gardens this year. Here's success to them!

SECRETARY'S CORNER

A Special Garden Bulletin.—A garden bulletin has been prepared by the Extension Division of the Minnesota State University especially to meet the extraordinary needs developing in connection with the campaign to increase the garden products of the country during the war. This bulletin very fully describes the operations in the vegetable garden, but it occupies too much room, however, to find place in this number of the monthly. Those who are particularly interested to receive this instruction are requested to send for a copy of the bulletin to R. S. Mackintosh, Extension Division, University Farm, St. Paul, Minn.

To Members of Junior Horticultural Club.—Owing to the unusual demand for space in this magazine, claimed by the special needs of the country in preparation for meeting the exigencies brought about by the war, the articles which would otherwise have been printed in the Horticulturist for the special benefit of members of the Junior Horticultural Club will be omitted part of the time during this year. Instead, however, a circular letter will be sent out to all of these members, and it is suggested that any questions pertaining to garden operations or to the society itself that any member may wish to ask should be addressed to R. S. Mackintosh, Extension Division, University Farm, St. Paul, and to such questions prompt replies will be made.

New Life Members.—Many names have been added to the life membership roll since the last annual meeting, as follows: Rudolph C. Schneider, St. Paul; H. L. Wallace, Grasston; A. G. Ruggles, University Farm, St. Paul; Henry Husser, Minneiska; Sil Matzke, So. St. Paul; John C. Wister, Philadelphia, Pa.; Harlow Rockhill, Conrad, Ia.; Dr. O. H. Wolner, Gilbert; Hjalmar Haakenson, Boyd; John J. Score, Bucyrus, N. D.; Rev. A. Wermerskirchen, Hokah; S. J. Jones, Minneapolis; Joe Baumgartner, Robbinsdale; Knute Bjorka, Belgrade; Dr. G. A. Eisengraeber, Granite Falls; F. W. Manz, Paynesville; B. M. Benson, Minneapolis, and John Krueger, Stillwater; Edwin O. Tollberg, Winner; C. C. Heath, Beltrami; F. K. Willson, Minneapolis; B. E. Bothun, Thief River Falls. In all twenty-two new life members since December 4, 1916.

(Continued on page 272.)

NOTICE OF SUMMER MEETING, 1917

A JOINT SESSION OF THE MINNESOTA STATE HORTICULTURAL SOCIETY AND ITS AUXILIARIES, THE MINNESOTA STATE GARDEN FLOWER SOCIETY, THE MINNESOTA STATE BEE KEEPERS SOCIETY AND THE NORTHWESTERN PEONY AND IRIS SOCIETY.

Will be held WEDNESDAY, JUNE 27th, 1917, in the Gymnasium

at University Farm, St. Paul.

THE GYMNASIUM BUILDING, in which this meeting is to be again held, was found last year to be espeically well adapted to our purposes. A very large room, excellently well lighted on three sides, with no posts in the center to interfere with the view gives an opportunity for a comprehensive view of the whole display at one time, which adds greatly to its attractiveness. The grounds about this building and on the wooded slopes around the football field, lying just south of the building, are now in a comparatively finished condition and fairly well sodded. The gymnasium will be open to exhibitors early in the morning, but visitors who are not exhibitors will be barred until noon, at which time the exhibition will be complete and judging done. It is almost impossible to do this work with the crowd of visitors who attend this annual display of flowers, making it absolutely necessary that it should be completed before visitors are admitted.

THE EXHIBITION will remain in place undisturbed until 9 o'clock in the evening. All the flowers and fruits exhibited become the property of the association and will be distributed later to the various hospitals in the Twin Cities.

THE PREMIUM LIST following this notice is practically the same as published in the May number of our monthly, and with a very few changes the same that was used last year. The winter of 1916-17 with a large fall of snow in this part of the state and plenty of moisture in the ground, create conditions especially favorable to perennial flowers, and with fairly favorable conditions since then we have every reason to anticipate an extraordinary display, probably the finest the society has ever made. The Northwestern Peony and Iris Society, a new organization, for the first time participating in the summer exhibition, will add interest to the gathering, and especially so as it is understood that a number of peony experts from a distance will visit us.

DEMONSTRATIONS. There will be usual demonstrations at the Farm, one by Professor Francis Jager, apiculturist, at 11:30 at the Apiary Building. No special subject has been announced for this, but it will certainly prove to be a profitable occasion to those attending. Professor A. G. Ruggles, of the Entomological Department, announces a display of spraying machines, of which there are a number of kinds at the Farm. It will be made just north of the Spraying Laboratory.

GUIDES TO THE GROUNDS.—Guides will be in attendance to escort visitors about the grounds to various points of interest. These guides will be prepared to answer questions pertaining to the various branches of educational work at the farm. Those who wish to take advantage of the service will meet the guides at the gymnasium at 10:30 a. m. and 3:30 p. m. The guides will wear suitable badges.

PICNIC DINNER.—In regard to the picnic dinner, which will occupy the time between noon and 2:00 o'clock, we are not quite sure as to where it will be held, but probably near the dining hall. Should the weather be unfavorable of course there is plenty of room inside the gymnasium building. Coffee will be provided, but the picnickers must *furnish their own cups* out of which to drink it.

AFTERNOON MEETING.—At 2 p. m. the afternoon session of the meeting will be held in the same room in which the display of flowers is made, at least that is the present plan unless the display should attain unexpected dimensions, in which case some suitable place, probably in the grove near the gymnasium building, will be used for that purpose. There will be

arranged the usual program of short talks, a number of which will be given on some of the prize winning perennials by exhibitors and visitors at the meeting. The session will be limited as near as possible to one hour, and it is especially requested that during the progress of the meeting all in attendance in the hall be seated, as any movement amongst the flowers on the part of those who desire to see them is sure to interfere with the success of the program.

REACHING THE GROUNDS.—Take the Como-Harriet car in either St. Paul or Minneapolis, get off at Doswell Avenue, and a walk of approximately one-half mile will bring you to University Farm grounds. To reach the gymnasium go north on Cleveland Avenue, which is the avenue running along the west side of University Farm, past the University Farm buildings until you come to the last building, which you will recognize as the gymnasium by its size. If you prefer to ride all the way to the grounds get off at Eustis Street, which the conductor will point out to you. From that place cars run every fifteen minutes into University Farm grounds, an extra fare of five cents being charged. Ask the conductor to let you off at the gymnasium building, which you will reach from the street car line. Getting off at that point saves a long walk from the terminal station. If in doubt as to the way, *follow the sign of the arrow.*

VISIT TO STATE FRUIT-BREEDING FARM.—This farm is located at Zumbra Heights, twenty-two miles west of Minneapolis on the Minneapolis and St. Louis railroad. The train leaves depot at 8:35 a. m. Return can be made by way of Zumbra Heights landing on Lake Minnetonka and the lake steamers via trolley line to Minneapolis, or by waiting until mid-afternoon a train can be secured returning to the city on the railroad. One or more of the professors will go out Thursday morning, June 28th, to accompany any who may desire to take advantage of this opportunity to visit the Fruit-Breeding Farm.

ENTRIES.—All entries must be received by the secretary *not later* than Saturday, June 23d. *No entries whatever* will be received at the meeting. The exhibitors are urged to send in their entries at as early a date as possible, under no circumstances later than the date noted above. Entry blanks will be furnished by the secretary on application.

EXHIBITS.—The judges will begin work on the exhibit promptly at 11:30, and any exhibit incomplete at that time will be judged on the basis of its condition at that time and not as to what it would be when the exhibit is completed.

Fruits and flowers shown become the property of the association.

RED CROSS FLOWER SALE.—There will be a sale of flowers at this meeting for the benefit of the Red Cross Fund, and an opportunity is offered to members to bring in flowers for this purpose. Bring loose flowers or bouquets of greenhouse flowers, garden flowers or wild flowers. All will be salable. Do not overlook this patriotic feature of our annual summer gathering. Be liberal!

Premium List, Summer Meeting. 1917.

No Duplicating of Varieties Permitted.

OUT-DOOR ROSES.

	1st prem.	2d prem.	3d prem.	4th prem.
Collection—three blooms of each named variety, to be shown in separate vases	$5.00	$3.00	$1.00	$0.50
Collection of named varieties—three blooms of each, in separate vases, amateurs only	5.00	3.00	1.00	.50
Three named varieties, white—each variety in a separate vase, three blooms of each, each bloom on a separate stem	2.00	1.00	.50	
Three named varieties, pink—each variety in a separate vase, three blooms of each, each bloom on a separate stem	2.00	1.00	.50	
Three named varieties, red—each variety in a separate vase, three blooms of each, each bloom on a separate stem	2.00	1.00	.50	
Collection of Rugosa and Rugosa Hybrids—each variety (consisting of one cluster of blooms on a single stem) in a separate vase	2.00	1.00	.50	
Most beautiful rose in vase	1.00			
Largest rose in vase	1.00			

Seedling rose to be shown by the originator. (Not previously exhibited in competition.) Bronze medal donated by the American Rose Society.

The following named varieties of roses to be entered separately and shown in separate vases, three to five blooms in each vase.

Prince Camile deRohan, General Jacqueminot, Margaret Dickson, M. P. Wilder, Jules Margottin, Magna Charta, Paul Neyron, Madam Gabriel Luizet, Baroness Rothschild, Anna de Diesbach, Ulrich Brunner, John Hopper, Rosa Rugosa (pink and white), Baron deBonstetten, Karl Druski, Madam Plantier, Grus an Teplitz.

Each, 1st prem., 75 cents; 2nd prem., 50 cents; 3rd prem., 25 cents.

PEONIES.

	1st prem.	2d prem.	3d prem.	4th prem.
Vase of Festiva Maxima, 6 blooms..	$2.00	$1.00	$0.50	
" " flesh or light pink " " ..	"	"	"	
" " medium or dark pink " " ..	"	"	"	
" " white " " ..	"	"	"	
" " red " " ..	"	"	"	
Collection—three blooms of each named variety in separate vases.....	$6.00	$4.00	$2.00	$1.00

In addition to the cash prizes offered the **American Peony Society** offers a silver medal for the best exhibit of the next above collection.

Collection—three blooms of each named variety in separate vases, amateurs only	6.00	4.00	2.00	1.00
Seedling peony, three blooms.....	3.00	2.00	1.00	.50
Collection—one bloom of each variety, shown each in a separate vase; for amateurs owning no more than ten varities	2.00	1.00	.50	

ANNUALS AND PERENNIALS.

	1st prem.	2d prem.	3d prem.	4th prem.
Vase of Canterbury Bells	$1.50	$1.00	$0.50	
" " Centaurea	"	"	"	
" " Columbine	"	"	"	
" " Dielytra	"	"	"	
" " Delphinium	"	"	"	
" " Evening primrose (Oenothera)..	"	"	"	
" " Forget-me-not	"	"	"	
" " Foxglove	"	"	"	
" " Gaillardias	"	"	"	
" " Grass pinks	"	"	"	
" " Iceland poppies	"	"	"	
" " Lilies	"	"	"	
" " Lupine	"	"	"	
" " Lychnis	"	"	"	
" " Annual poppies	"	"	"	
" " Oriental poppies	"	"	"	
" " Pansies	"	"	"	
" " Perennial coreopsis	"	"	"	
" " Pyrethrum	"	"	"	
" " Shasta daisies	"	"	"	
" " Sweet william	"	"	"	
Collection—named perennials, in separate vases	$6.00	$4.00	$2.00	$1.00
Collection of annuals and perennials in separate vases (not to exceed 12) by amateurs who have never taken premiums on flowers.....	4.00	3.00	2.00	1.00
Collection—named iris, in separate vases, 5 blooms each.....	3.00	2.00	1.00	
Collection of wild flowers, in separate vases	4.00	3.00	2.00	
Collection of flowers by children.....	2.00	1.00	.50	
Vase of any kind of flowers not named in this list. (An exhibitor may make any number of entries desired under this head)	2.00	1.00	.50	
Vase of flowers arranged for artistic effect	1.50	1.00	.50	
Basket of outdoor-grown flowers, arranged by exhibitor.....	3.00	2.00	1.00	

STRAWBERRIES.

One quart of each variety to be shown on plate, not in box.

	1st prem.	2d prem.	3d prem.	4th prem.
Collection (not less than six varieties)....	$5.00	$4.00	$3.00	$2.00
Collection of three named varieties.....	3.00	2.00	1.00	.50

The following varieties of strawberries to be entered separately:

	1st prem.	2d prem.	3d prem.	4th prem.
Bederwood, Dunlap, Crescent, Splendid, Clyde, Warfield, Lovett, Enhance, Glen Mary, Haverland, Minn. No. 3, Progressive, Superb, Americus, each.....	$1.00	$0.75	$0.50	$0.25
Best named variety not included in the above list	2.00	1.00	.50	
Seedlings, originated by exhibitor.....	3.00	2.00	1.00	

SECRETARY'S CORNER.

(Continued from page 268.)

New Fruits for the Trial Stations.—There have been sent out recently from the State Fruit-Breeding Farm to the Trial Stations operated in connection with the society, as Supt. Haralson writes me, a sufficient quantity of plants of No. 935 strawberry to give it a good test throughout the state, and vines of twenty-seven varieties of grapes, originated, of course, at the Fruit-Breeding Farm, from one to four vines of each sort. Some of these grapes, Mr. Haralson says, are much better than the Beta grape, both as to size and quality, and all are hardy without winter protection there at the station.

Among other new fruits from abroad received this season at the Fruit-Breeding Farm for testing and experimental work is a quantity of Prof. N. E. Hansen's seedling pears, what are considered hardy crosses and blight-resisting, which is equally as important in the growing of pears as to have them fully hardy. These trees, we understand, are seedlings that have not yet fruited. They constitute a very interesting experiment as to hardiness and blight resistance. Quality can be worked in later if proved to be right in those respects.

Resin Bordeaux Mixture, or Resin-Lye Bordeaux Mixture.—As it is sometimes called, is simply the ordinary Bordeaux mixture with the resin-lye mixture added. This resin-lye mixture is what we call a "sticker." Its purpose is to cause the spray material to spread evenly and to adhere better to the somewhat waxy young raspberry canes. Its preparation is as follows:

Pulverized resin	5 lbs.
Concentrated lye	1 lb.
Fish or other animal oil	1 pt.
Water	5 gals.

Put the oil, the resin and one gallon of water into an iron kettle or other metal container and heat until the resin softens, that is, until it is pretty thoroughly dissolved. Then add the lye. Stir thoroughly. Add to this four gallons of hot water and boil until a little of the boiled material mixed with cold water gives a clear, amber colored liquid. Add water sufficient to make the total, after boiling, five gallons. This is the stock solution.

In spraying with Bordeaux, or any other fungicide or insecticide with which this sticker is used, add two gallons of this stock solution to eight gallons of water and add to forty gallons of the spray mixture. The spray mixture to which this is added should be made with ten gallons less water than the formula indicates, because this will be added with the resin-lye.

The Wisconsin Secretary Calls.—We were fortunate in having a very pleasant visit of a couple hours with Frederick Cranefield, Secretary of the Wisconsin State Horticultural Society, who happened to be passing through the city, returning to his home from a visit with his brother in South Dakota. The writer had the pleasure of spending several days with Mr. Cranefield in Washington in November, where he was in attendance for the same purpose that took me there, the organization of a national horticultural society. Mr. Cranefield is chairman of the committee appointed to draft a constitution to be submitted at the next meeting of this new organization, which we understand is to take place at the next annual meeting of the American Pomological Society, probably in September next, although the notice of this meeting is not yet out. Mr. E. R. Lake, Secretary of the American Pomological Society, was elected secretary of this new society, but on account of ill health and absence from Washington, he has been obliged to resign this office, which is now filled by the appointment of Mr. W. M. Scott, of Bureau of Markets, Department of Agriculture. The proposed constitution has called this new organization the "National Council of Horticulture." Copies of this proposed constitution are to be submitted to the charter members for suggestions as to revision for final presentation as above.

SETH H. KENNEY IN HIS TOP-WORKED ORCHARD.

While it is not the intention to publish anything in this magazine that is misleadng or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 JULY, 1917 No. 7

IN MEMORIAM—SETH H. KENNEY

SETH H. KENNEY PASSED MAY 24, 1917, AGED 81 YEARS.

This veteran of Minnesota horticulture ended his days on the farm in Morristown which he took up as a claim about the year 1866. Mr. J. O. Weld, now living at Mound, Minn., a close personal friend of Mr. Kenney from boyhood days, came to this state the same year and has maintained intimate relations with Mr. Kenney since that time, and the facts herein given are in part the personal recollections of Mr. Weld.

The place of birth of Mr. Kenney was Colrain, Mass., and the date February 22, 1836. The writer had a personal acquaintance with Mr. Kenney going back to a time prior to 1880. The records of the society show that his first service to the association was at the winter meeting of 1873, where he presented a report, reciting his experience in growing an orchard and fruit garden on his claim at Morristown. In 1876 he contributed to the program a paper on "Strawberry Culture," and the following year one on "Cranberry Culture." These contributions can be found in our published reports in the years stated.

During the earlier years of Mr. Kenney's connection with this society he was better known as the grower and producer of an improved variety of sorghum, called amber cane. He established this industry in our state and promoted it to a very large extent somewhere about the year 1877. He succeeded in organizing an Amber Cane Association which, as I recall, held annual

meetings for many years, although it has now been long extinct. In connection with the report of this society for 1889, a report of the Amber Cane Association was published and will be found interesting reading to any who care for this subject. The United States Department of Agriculture recognized the valuable service which Mr. Kenney rendered to the country in this connection, and it was a source of pride to Mr. Kenney in his later years that his efforts in this industry had been given such prominence by the Department.

The last twenty years of Mr. Kenney's life he took a larger and increasing interest in fruit growing, and the recorded results of his original work appear from time to time in the publications of the society. Recognizing the special value of his service in this direction, he was appointed superintendent of a society trial station, his first report as such appearing in the records of the society in 1909. Thereafter annually, and usually semi-annually, his records of valuable experiments were published regularly in our monthly. His contributions to the experience of our members in topworking were of a special value.

In recognition of the value of Mr. Kenney's services in the fields above referred to, the Minnesota State University in January last awarded a "certificate of award for special meritorious services in the advancement of agriculture." This certificate would have been given to Mr. Kenney in person at Farm Week, University Farm, but on account of the shock which he had then already experienced, he was unable to be present. His life and work, however, were referred to from the platform and the certificate awarded sent to him at his home. His host of friends rejoiced that this well earned commendation should come to him when he was still in possession of his faculties and able to appreciate it.

Mr. Kenney's name appears as an annual member of the society on our roll in 1877, although it is probable that he was a member before that date, as he attended the meetings and took part in the program as early as 1873. In 1899 in recognition of Mr. Kenney's valuable services to the society he was unanimously made an honorary life member. Few members have contributed more to the welfare of the society than Mr. Kenney, and it is safe to say that no member surpassed him in loyalty to this association. For many years and until the last year or two, when his bodily infirmities kept him away, he was a regular attendant and participant at our annual gatherings. It was only until January

last when he practically gave up working in his beloved art. At that time he had his first shock, but even after that with his feeble hand he wrote inspiring letters up to the very time of his second attack, which occurred four weeks before his death.

Mr. Kenney's home life remained intact almost up to the time of his passing, his wife having died only on January 29 last, and the granddaughter, who made up the third member of his family, dying two weeks later. Of the four children which made up his family, three are still alive, one, Elias Kenney, living on a farm adjoining his father's place; the other two, Fred and Maurice, now residents of the Pacific Coast.

The picture of the "Veterans of Horticulture," which appeared as frontispiece of the 1898 volume of the annual report of the society, will be of special interest to the older members of the society. The photograph from which this picture was made was taken at an annual meeting of the society on December 7, 1897, just twenty years ago. Of these twelve veterans not one is now with us, the last one passing being the subject of this sketch. Grand old men, all of whom sacrificed much for this society and the art which it stands for! None of them excelled in these respects our dear brother who has just gone home.

Mr. Kenney was for many years a member of the Baptist Church, his membership going back to his early manhood. His life fully exemplified not only by what he said but more by what he did, the sincerity of this relationship—an earnest, honest, Christian gentleman, strictly reliable in all of his dealings with his fellows, a shining light in the religious world. We know he gave very liberally of his means to support this organization with which he was connected, and especially for the prosecution of its work in foreign lands.

The writer felt very near to Mr. Kenney during the later years of his life, and no one has seemed to carry out in a sturdy, effective way the principles of the Christian religion which he professed more so than did our friend who has just left us. These are few words with which to close reference to so good a life as Mr. Kenney lived. We may well take him for an example and aspire to live upon so high a plane.—Secy.

MIDSUMMER REPORTS, 1917.

Minnesota State Fruit-Breeding Farm.

CHAS. HARALSON, SUPT., EXCELSIOR, MINN.

June 13, 1917.—Owing to the late spring and a great deal of cold weather the small fruits are later than usual. However, the outlook for a good crop is promising.

The strawberries came through the winter in very good condition; No. 935, No. 3 and No. 1075 promise a very good crop. The same is true with a number of other selected varieties.

The No. 4 raspberry is in good shape for a heavy crop of berries. It came through the winter in perfect condition; the canes are healthy and making a good growth.

Gooseberries and currants promise a full crop, and the same is true of a number of the seedlings.

The hybrid plums blossomed very full this spring. A number of varieties have set a satisfactory crop of plums, many new varieties are fruiting this year for the first time, and we hope to have some valuable varieties out of this lot.

The seedling apples are in good growing condition, but there will not be very much fruit this year. The standard varieties, such as Wealthy, Patten's Greening and many other varieties, are setting a full crop, and the same is true of crab apples.

The Beta grape seedlings came through the winter in good shape; they are in full bloom at this writing.

Some tender varieties of apples, topworked on Hibernal, Patten's Greening, Duchess and Gould crab, were hurt more or less from winter killing. However, a number of varieties are setting a light crop.

Approximately 10,000 raspberry seedlings, grown from seed this spring, have been transplanted to flats and into cold frames. Some of these will probably be planted out in the field later on.

Several bushels of plum pits were planted this spring, and we have a good stand of seedlings at this time.

The plant-breeding work has been carried on as usual during the spring, and some interesting crosses in both plums and apples have been made.

A great deal of spraying, with lime-sulphur and arsenate of lead, has been done this spring on plums, apples, gooseberries and currants to check insects and fungous diseases.

Jeffers Trial Station.

DEWAIN COOK, SUPT.

June 12, 1917.—New varieties of fruits planted on our trial grounds the spring of 1917 were seventeen varieties of grapes, No. 1 to No. 17, sent here by Mr. Charles Haralson, also strawberry No. 935 from the same source. In plums we received scions from Mr. A. B. Dennis, of Cedar Rapids, Iowa, which are now growing nicely, viz., Wilson, Mammoth and two other unnamed varieties all full blooded Japanese and said to be the largest varieties of plum grown. We also received from Prof. N. E. Hansen two trees each of his new sand plums, the Kiowa and the Cree. These two varieties are said to ripen their fruit after all of our standard varieties. In this part of Minnesota we need some varieties that ripen later than those usually grown..

The past winter was one of unusual severity. Snow came in December and stayed on all winter. Drifts ten to fifteen feet high in our orchards was not uncommon. Many nursery trees and low headed plum trees were broken down by the settling snow and thus destroyed.

The season up to date has been cold and backward, with a great amount of rain and cold east winds. There was little sunshine during the blooming period of the plum and still less sunshine during the apple blooming period.

As to the prospect of fruit, strawberries Minn. No. 3 and Minn. No. 1017 are looking very fine and promise a big crop. Varieties of grapes from our State Farm have proven somewhat disappointing. They were all pruned last fall and laid on the ground but not covered, except they were covered by snowdrifts several feet deep nearly all winter. Yet No. 1 killed badly, Nos. 2 and 3 are nearly dead, No. 4 fair, Nos. 5 and 7 good, No. 6 killed some, No. 8 pretty good.

As for the prospect for plums, the Japanese hybrids may save the day, my one tree of Rockford plum may bear a crop, but otherwise I have not noticed any variety of native American varieties that promises to bear more than a few specimens to the tree, but the Japanese hybrid plums as a class give promise of a good crop. Stella, B. A. Q., Emerald, Omaha and most of the varieties originating at our Minnesota Fruit-Breeding Farm look specially promising for a fine crop of plums, thus again demonstrating the ability of this class of plums to set a crop of fruit under adverse conditions.

We cannot as yet know what to expect from the sand cherry hybrid plums, but do not expect very much from them this season. The blossoms have not dropped yet. The Compass cherry bloom has been destroyed by the brown rot, and the other sand cherry hybrid varieties seem to some extent to be doing the same thing.

The Wealthy apple, also the N. W. Greening, Malinda and some others, in spite of the big crop of 1916, blossomed very full, and we have hopes of getting a crop of apples of these varieties, but we can tell better a little later on.

Collegeville Trial Station.

REV. JOHN B. KATZNER, SUPT.

That the winter was cold need not to be mentioned, everyone knows that, but we desire to call attention to a few points which are of some interest to horticulture. It may not be known generally that we had 200 degrees more subzero weather than the previous winter, footing up a total of 700 degrees below zero for the winter of 1916-17. This material increase of cold is responsible for the greater injury to trees than that of normal years. We shall mention a few.

The apples King David, Senator and Delicious topgrafted on Hibernals are ruined, two-year-old Wealthy trees in the nursery are frozen badly, some down to the ground, others have brown wood; scarcely one escaped injury. Even Wealthy trees of bearing age are seriously damaged. Plums Nos. 3, 20 and 15 froze back two to eight inches and No. 27 lost some of the lower branches entirely. Our sweet cherry tree, ten feet high, and the Chinese pear No. 21923, which was considered entirely hardy, are dead and gone. The old Wealthy trees and others of equal hardiness suffered some from the long continued cold, but not seriously. In regard to hardiness of trees one may get an object lesson now in the orchard. Some apple trees make a healthy growth, others only a feeble attempt. There are Chinese and Pattens seedling pears growing vigorously, and among them stand German pears frozen dead to the ground. Other plum and pear trees were heeled in over winter, and nothing can be said about their hardiness. Even bull pines up to eight feet were seared as if by fire, but our variety is not of the hardy kind. We had a fine ampelopsis engelmani, running up about twenty-five feet on the south brick wall of the library building; today it is a beauty of the past and dead to the ground.

Having mentioned some of the trees which have been injured by cold, it is no more than right to call attention to some varieties on trial that were not injured last winter. Among these are all the apple trees from the Minnesota Fruit-Breeding Farm, as Nos. 90, 271, 269, 16, 1, 7045, Gilbert, Winesap, Russet Seedling in the nursery and the larger Malinda seedlings in the orchard. We were agreeably surprised to find their wood perfectly healthy. To these should be added the apple varieties listed of first degree of hardiness and many kinds of the old and new plums in good condition. Then mention should be made of the Chinese pears

Nos. 21880, 21982 and Pattens seedling pear, which did not suffer. Prof. N. E. Hansen's hybrid pears had been heeled in and nothing can be said about them. The strawberries Nos. 3 and 1017 and the raspberries, having been covered in fall, came through winter in fine shape. The tame grapes, but not the Alpha, had been covered and passed the winter safely.

We had unusually much snow and, while this certainly was helpful to somewhat tender trees, it also did a little damage. The snow drifted badly, on some places it piled up seven to ten feet high. These drifts were dangerous to small trees. Thus two of our plum trees, Nos. 3 and 8, were split and broken down by the snow. The nursery was completely filled up with snow about five to six feet high, bending down or covering all young trees. As a consequence many trees were broken and had the buds rubbed off by the settling snow.

Mice and rabbits were unusually active. The deep snow helped the rabbits to reach up on some trees six to seven feet high, where they bit off all the buds they could get a hold of. And below the snow the mice got in their work on young trees where not protected. Some eight pear trees were either girdled entirely or the bark badly injured. Of course the trees are not lost, as they grow again from the scion, but it will set them back a year or two. The best protection that can be given to young trees is undoubtedly a good wire netting put around the stem at least two feet high. Although we meet many difficulties in horticulture we must not give up, but rather try to overcome them.

As soon as the frost was out of the ground the work was started at the station. A section of our orchard was replanted, mostly to Wealthys. The old trees had blighted so badly that it was thought best to remove them entirely. This was done last fall, and their place is now occupied by young trees which were set twenty by twenty-four feet apart. This distance apart will be adhered to in all our future planting of apple trees. The trees of the original orchard were planted only sixteen by sixteen feet, and while this distance is quite satisfactory as long as the trees are small it is entirely too close when the trees grow large and spread. Then the trouble begins; the branches interlock, the lower branches die, the circulation of air is insufficient, the fruit does not color up, the quality is inferior, insects are harbored and multiply, and the menace of all apples trees, blight, finds a

quiet place to do its deadly work. By setting the trees farther apart these difficulties are more or less obviated.

The plum trees we obtained last year from the Minnesota Fruit-Breeding Farm had been heeled in and were transplanted in the trial orchard. We also ventured to set out a small pear orchard of thirty-two trees. The trees of this orchard consist of Prof. N. E. Hansen's hybrid pears Nos. 3, 10, 12, 13, 24 and 38; of Chas. Patten's seedling, and of two Chinese varieties from the U. S. Department of Agriculture. These pears are all very hardy and so far free from blight.

In the nursery were lined out several hundred apple and plum grafts, mostly of Wealthy and plum No. 8. We obtained quite a lot of new material for trial, which was also planted in the nursery. We received eight varieties of hybrid pears from Prof. N. E. Hansen, Brookings, S. D., and from the U. S. Department of Agriculture fourteen varieties of Chinese and hybrid pears, four varieties of Russian hybrid plums, one each of a prune, apricot and peach. Prof. Hansen's hybrids are one year old budded trees of Chinese and American parentage considered hardy and immune to blight. Those from the Department of Agriculture are either pure Chinese pears or hybrids of Chinese and American varieties, also thought free from blight, but their hardiness may be deficient. The four kinds of plums are hybrids between the sloe—a small, wild, spiny plum, and the green Reine Claude. These plums ought to be hardy here as they come from central Russia. The peach is only a wild shrub from Siberia, and the prune and apricot are not supposed to stand our climate. Besides this there are on trial a green plum (seedling) and three fine hardy apple seedlings. So we have enough new material on hand for trial, and we expect to find at least a few varieties adapted to our conditions.

But we have some more new things. From the Fruit-Breeding Farm we obtained twenty-seven new varieties of grape vines. We are very glad to have them. They were given the best location at our disposal by cutting out some old Concords and giving their place to these new arrivals. They will get good care, but will not be protected over winter to test their hardiness, and if the fruit is found superior to that of the Beta they will be retained. We also received three dozen strawberry plants of No. 935 and ten raspberries of No. 4. All these plants were carefully planted and are growing nicely. Last year's raspberry plants are now transplanted on a better location and are expected to do better this year.

Our spring was abnormally cool and much later than last year; in fact, it was too cold for anything to grow till the middle of May. The first tree to open its flowers was the Patten's pear seedling on the 17th of May, which was followed by some plums the next day, and by the 25th they were in full flower. At that time a few apple blossoms were seen, too, but the trees only came in full bloom by the first of June. This makes the season for the growth, development and ripening of fruits rather short.

We have to mention one other enemy to horticulture, the Bohemian waxwings. It seems these birds had just been waiting for the first leaves and flowers to appear on trees to get in their work, for as soon as the Chinese and Patten's seedling pears started to grow these birds were right there and picked off the tender leaves and flowers entirely. Some trees are still without leaves. To protect some of the blossoms on a Patten's pear we covered them with cheese cloth. We don't know what these birds are good for anyway. They only live on buds, leaves, blossoms and small fruits all the year around and seem to keep shy of insects. We also had a light frost on May 22d, but it did not do much harm. We noticed, however, a few early blossoms in strawberry No. 3 and a few buds on the grapevines near the ground to have been frozen.

With the advent of warmer weather and a good rain all plants and trees started to grow vigorously, and the prospects for a good crop of fruits are now not so gloomy as three weeks ago. In fact, if nothing unforeseen should happen, we may get a very good crop of apples and plums, strawberries and currants. The tame grapes will bear well and the Alpha is out for a full crop. We have changed our opinion in regard to the Alpha being a pure native variety, for its whitish down, reddish buds and thicker hairy leaves indicate it to be rather a hybrid than a native vine, though it was found growing wild in the woods.

Do Birds Return Year After Year to the Same Nesting Places?—This question is probably hard to answer except in a general way; but occasionally birds with peculiar markings are found and these can be identified. For example, in West Chester there is a robin with a snow-white tail that for four or five years has regularly appeared and spent the summer there.

In the same place there is a maple tree, with a dead, dry, hard limb, on the tip of which, for several years, a male downy wood-pecker has come, with each spring, to rap, rap, rap, in the early morning, loud enough to be heard by all the neighbors. The limb is so small, hard and dry that it can contain little or no food. It is probably a freak of a single bird, that, for some reason, comes from mere "force of habit," to his "old stamping ground."—"Forest Leaves."

Mandan, N. D. Trial Station.

W. A. PETERSON AND MAX PFAENDER.

The past winter has again been a very severe one from a horticultural standpoint. A detailed report on the varieties sent to us from the Minnesota Fruit-Breeding Farm cannot be prepared at present, but a few general statements can be made.

Apples, plums and cherries have all suffered severely. A few varieties of crabs are more promising. All named varieties of grapes, including the Minnesota numbered ones, died, even though they had been protected with soil.

Some currants are excellent, and there is a great difference in hardiness even between the common varieties. Gooseberries were all injured severely, except those covered with soil. Strawberries were all killed or injured, except the South Dakota variety.

Native fruits under cultivation here all came through perfectly. Juneberries, plums, buffalo berries, choke cherries and currants, all started their new growth from the terminal buds.

The Norway and Carolina poplar have proven worthless. The Northwest poplar has been the best one tested here and the Canadian poplar is a close second. The laurel-leaf willow is hardier than the Russian golden.

The best ornamentals are Tartarian honeysuckle, golden currant, spireas arguta, salicifolia and sorbifolia, Persian lilac, native rose, Siberian dogwood, buckthorn, josekea and Villosa lilacs and the common lilac.

Everything seems to point to the fact that the horticulture of the future in this region, known as the Northern Great Plains, will need to be revised from its very foundation.

Such a revision must be based on:

First—Testing of the most promising varieties and saving only the very hardiest.

Second—A study involving the basic fundamentals of effects of stock on scion and vice versa.

Third—An entirely new method of culture of those fruits which are usually grown in orchards.

Fourth—A thorough study of best methods of winter protection.

New Auburn Trial Station.

R. F. HALL, SUPT.

June 12.—In making my first report it might be of interest tc the members of the society to know where the new trial station is located. New Auburn is an inland town located in the northern portion of Sibley County, nine miles southwest of Glencoe, where a trial station was conducted for many years by the late Captain A. H. Reed.

R. F. Hall.

New Auburn is situated on the shores of a beautiful wooded lake of the same name, which is five miles long and one and a half miles wide, in the center of which is High Island, containing eleven acres of heavy timber. Its banks are thirty feet above the water. One can hardly imagine a more picturesque spot.

In approaching the town tourists are impressed with the beautiful scenery and exceptionally well kept streets which are lined for a mile with fine large shade trees. The entire village has the appearance of a park. There are many small orchards of the most desirable varieties of apples and plums. There is every prospect for a very heavy crop of fruit this year.

As the writer is recovering from a severe illness, he is unable to make a more extended report at this time.

ANTS IN THE HOUSE.—Sometimes ants are troublesome in the house, especially in the kitchen. Professor Waldron, of the North Dakota Agricultural College, recommends wetting a sponge with sweetened water, leaving it where the ants are for a few minutes. They will crawl into it. Then drop it into boiling water to kill the ants and repeat. Another method is to grease a plate with lard. The ants will crawl onto it and get stuck. Kill them by dipping the plate into hot water.

La Crescent Trial Station.

D. C. WEBSTER, SUPT.

June 13, 1917.—There seems to be nothing of particular note to report from this station at this time.

Trees and fruit of all kinds came through the winter in excellent condition, and especially strawberries are perhaps in better condition than ever before. Owing to deep snow they were well protected from cold, and conditions since spring have been ideal. The Minnesota No. 3 certainly has all indications of being the business berry. Everbearing No. 1017 blossomed full, but the blossoms were picked off to encourage bloom later in summer. The Carrie gooseberry is not set as heavy as last year.

The plums for trial, set in 1914, all bloomed full, but for some reason there is a very light setting of fruit.

The apples for trial set last year are about all growing well.

Of the grapes received this year some are not starting well —will probably lose a few.

Strawberry No. 935 received this spring doing fine.

Apples indicate a fair crop. Wealthys a good crop on trees which did not bear last year. Wealthy seems to fall into bearing alternate years after reaching about ten years of age.

My N. W. Greenings, however, seem to bear more regularly each year. Last year they bore a good crop. This spring bloomed heavier than ever, but are setting a light crop of fruit.

The weather has been very catchy, and it is hard to get work done.

Strawberries will be rather late, none before June 20.

Nevis Trial Station.

JAS. ARROWOOD, SUPT.

June 16, 1917.—Last winter was one of the worst winters that we have had for many years. The ground froze very deep, and no snow fell until late in the season. We had some top-killing and some root-killing in apple trees, mostly confined to Hiberals, Duchess and Wealthy; in plums mostly confined to the Surprise and hybrids that were crossed with the Burbank. In regard to strawberries, they suffered quite badly. Raspberries stood well except some hybrids. Sunbeam stood best of all. Gooseberries and currants stood well and will be a good crop.

Plums point to a good fair crop. Apples will not be a large crop this year, I think. The spring has been cold and unfavorable. Most all the hybrid trees from Central Station have killed back quite badly and will have no fruit on them this year. The Hansen stock has suffered some. My Silver Skin prune came through in the best of shape and will have a good crop. It did not kill back a bud. Grapes are looking good and if weather is good from now on will have a good crop. Arrowood's Pride and the Beauty are in line together, both doing finely. The garden is away back on account of cold, frost and no rain. Shade trees are mostly doing well.

Paynesville Trial Station.

FRANK BROWN, SUPT.

June 16.—The past winter has again demonstrated to us that we are not in the banana belt, as some of our traveling salesmen seem to think.

One of the worst losses has occurred in Opata and Sapa plums, seemingly as hardy as an oak; still many trees have failed to answer nature's call to life this spring.

The trees, plants, etc., sent out from the Fruit-Breeding Farm have mostly gone through the past winter in good shape. The plum trees are all alive and growing finely; No. 12 is again full of fruit, but a frost last night (June 15th) may make a difference with results.

The two raspberry varieties sent out the spring of 1916 are still alive. No. 30 froze back quite badly, but is recovering nicely and will be fairly well loaded with fruit; the new canes of this spring's growth are also budding and bid fair to fruit. No. 31 did not grow as well last season, froze back about the same as No. 30, and is making about the same recovery.

The apple varieties sent at the same time all are alive and are doing fairly well.

Minnesota No. 4 raspberry is coming to the front with a speed that bids fair to put it in the class that is now occupied entirely by Minnesota No. 3 strawberry. This raspberry came through the past winter in perfect condition. It is a good plant maker, seems to be healthy in all ways, and so far is just what we have been looking for in a raspberry.

The grapes sent to this station this spring are all alive and doing well, but for several years the late frosts have damaged the new growth on grapes to such an extent that results are very discouraging.

The strawberries received this spring are looking very fine, the foliage is an intense dark green, and the plants are certainly pushers. I hope the berries are as good as the plants.

To Improve An Old Lawn that has become run down is often more difficult than to make a new one, but if reasonably good turf exists, it can be bettered materially by reseeding and fertilizing. If the lawn is patchy, the small areas should be scratched with a steel rake, dressed with loam or compost and the seed sown on this. If large areas of the lawn have a thin covering of turf it will be advantageous to use a disc seeder. After seeding a second dressing of loam or compost should be applied and the areas rolled lightly.

Sauk Rapids Trial Station.

MRS. JENNIE STAGER, SUPT.

We had a very cold and backward spring and even now (June 13th) the ground here (clay) is cold and vegetation comes along slowly. Luckily for us, however, fruit blossoms coming so slowly were not struck by the usual jack frost, who generally waits until everything is blooming and then strikes, not one night, but several in succession, until all our hopes of a generous harvest are blighted. At this time the plum trees are loaded with

Mrs. Stager's grandson among the tulips—against a background of No. 4 raspberries, apples, plums and evergreens, planted five years ago.

the promise of fruit, also currants, gooseberries and strawberries. The strawberries, No. 935, sent me by Mr. Charles Haralson from the University Farm, are extra strong, hardy looking plants and are doing nicely.

We had a very large apple crop last fall, so of course do not expect to have as many this year; still the trees look good for a smaller crop.

Flower plants are also loaded with buds, and the white and red rosa rugosas, sent by Prof. Cady last year, have each a beautiful double rose on them and look as proud of them as I am.

Potatoes and all vegetables are backward, but still they are coming.

West Concord Trial Station.

FRED COWLES, SUPT.

June 16, 1917.—After a cold and severe winter we see no signs of winter-killing. The deep snow perhaps protected some things. Small apple trees were broken down badly by the heavy snow. A few trees had branches broken also.

Trees of all kinds blossomed very full this spring and late enough so that the frost did no damage, and there is promise of a full fruit crop. A few of the plum trees from the Fruit-Breeding Farm have set a little fruit, and the grapes received two years ago are blossoming this year. All the plants received this year are doing well.

The everbearing raspberry from the Fruit-Breeding Farm lived through the winter well and seems very hardy. No. 4 is also a hardy variety and a valuable berry.

The everbearing strawberry No. 1017 is not proving profitable on our soil, but Progressive and Superb are fine. Those set in the spring of 1916 produced a good deal of fruit the same season, and this spring are full of fruit, two or three weeks earlier than the June-bearing kind. We shall encourage their culture on account of the long season. The Minnesota No. 3 still holds out well. It is a strong plant maker and a good fruit producer.

Currants and gooseberries are full of fruit, and the worm has not showed up yet.

All flowering shrubs and plants are doing well, snowballs are better than for a number of years. Spirea arguta is one to be prized on account of its early blooming, coming two weeks earlier than Van Houttii. The iris are full of bloom at this time. Lilacs are about gone, except a few late kinds. Peonies and roses are late this year.

Careful Attention Is Necessary if an established lawn is to be kept in good condition. Most lawns need an occasional application of some good fertilizer regardless of the kind of soil on which they exist. Thoroughly rotted stable manure is excellent for this purpose. Another good dressing is a mixture of manure well composted with sod and leaf mold and sifted before using. It is desirable that the material be applied in such condition that there is nothing to rake off. Coarse humus or humus dressing should never be used, as the grass is almost invariably killed in small patches beneath the lumps. The humus dressings should be applied in the autumn or winter and again in the spring. Bone meal is one of the best commercial fertilizers for the lawn. When used it should be applied in the late winter or early spring at a rate of ten to fifteen pounds to the thousand square feet.

Top-Working with Tender Varieties.

(Abstract of paper, with lantern slides, delivered at the 1917 winter meeting.)

F. L. WASHBURN, STATE ENTOMOLOGIST, UNIVERSITY FARM.

Receiving a year ago from Harold Simmons, of Howard Lake, a box of large sized specimens of Delicious, Grimes' Golden, King David and Jonathan, all grown in Minnesota on top-worked trees, induced me to carry out some of this work in a small orchard I have at Lake Minnetonka. Hibernal and Patten's

1. Jonathan top-worked on Hibernal.

4. Italian prune grafted on seedling plum.

Greenings were the varieties used for stock. Scions were obtained from Missouri. Top-working was done in the latter part of April, and all scions made a wonderful growth as evidenced by these slides.

As an experiment a seedling plum was top-worked with an Italian plum scion obtained from the Pacific Coast. It made a growth of over six feet, as shown by lantern slides. It was hardly expected that this would survive the winter.

We also show slides illustrating the vigorous growth of a silver prune grafted upon a hardy plum stock by Mr. Arrowood of Nevis, Minn., who kindly gave us two trees for experimental use on our own ground. One of these trees had some bloom upon it this season, but the flowers were evidently sterile, at least they

set no fruit. These trees are very vigorous and apparently hardy. Mr. Arrowood has exhibited fruit obtained from his own trees of this variety at Nevis.

Incidentally the slides show the wood veneer protection around the trunks, an excellent safeguard against the work of field mice and also against rabbits if the snow does not become too high. Please note that in the case of the apple scions they made a growth of all the way from four to five feet during the summer. One slide shows a Hibernal girdled the previous year by rabbits, and therefore used for two cleft grafts of Grimes' Golden. These scions made a wonderful growth.

2. Grimes' Golden apple grafted on Hibernal—a cleft graft following rabbit injury.

3. Silver spruce grafted on hardy plum stock.

We are so encouraged with the outlook that we purpose to put more scions of the same varieties in these trees next spring and top-work other trees with similar varieties.

Foot Note.—April 24, 1917. Every one of the above apple scions came through last winter's severe test in splendid condition. As was expected, the Italian prune scion and a peach plum scion killed down to the stock.—F. L. W.

Horticulture in Western Canada.

PROF. F. W. BRODRICK, AGRI. COLLEGE, WINNIPEG, MAN.

We in Manitoba appreciate fully the excellent work that your society is doing in the advancement of horticulture in your state. We know that the various lines of horticulture, including pomology, vegetable gardening, floriculture, plant breeding and landscape gardening, are all receiving recognition and support from you.

We rather jealously recognize, too, the excellent financial support which your society is receiving from your state legislature. We are not so fortunate—in this connection—in Manitoba, although the cause of horticulture is receiving fairly liberal support. No institution can do effective and permanent work without substantial and well-directed financial aid. A society such as this, to succeed, must have financial support from the state and must have the moral and intellectual support of its members.

I am pleased to note the splendid co-operation that exists between this society and your State Agricultural College. The work in the college will not succeed without the practical support of the society, and the society in turn is benefited by the scientific and technical work of the college—a happy arrangement which is of benefit to both.

We in Manitoba are looking to Minnesota for suggestions in the solution of our horticultural problems. Your problems are largely ours, and we are profiting by your experience. Our problems, due to the more trying climatic conditions, are probably more difficult of solution than yours. We are doing what we can to solve them. The Agricultural College and the Horticultural Association are working hand in hand to solve the problems confronting us. Horticulture and the related sciences are now being taught as regular subjects in our college courses. We, in this way, are impressing upon our young men the importance of horticulture as a specialized industry.

We are also endeavoring to develop specialized men in horticulture to meet a need that seems to have arisen in connection with our experimental farms, our forestry branch, our railroads and in the civic improvement of our towns and cities. This need will grow as the country develops and becomes more thickly settled, and as our civic institutions become more permanently established. Our short term men are being instructed in this

subject with the hope that horticulture will find a more permanent place on the farms of Western Canada. In the endeavor to make a home and acquire wealth quickly, many of our people in Western Canada have overlooked many of the things that give to farm life that true home-like touch. We find that an interest aroused in our boys and girls, and young men, is more quickly taken up as a part of the life on the farm.

With the object of developing a more widespread interest in the subject of gardening, we are encouraging our Boys' and Girls' Clubs, in connection with the College Extension Work, to each develop and maintain a garden as their own farm during the coming summer. To supplement this work in gardening, the boys and girls are encouraged to put the products of their gardens in cans and thereby acquaint them with some of the end products of horticulture.

Prof. F. W. Brodrick.

Our Horticultural Association, constituted somewhat similarly to this society in your state, is doing valuable practical work in the devolopment of horticulture in Western Canada. Attached to the association are practical men and women from all parts of the West. These men and women are working through the Provincial organization, or through their local societies, in promoting a greater interest in horticulture in general. We find that local societies stimulate local interest, which finally works out to a wider field and thereby increases the value of the work from a Provincial standpoint.

One of the most valuable lines of work of the local societies is the holding of horticultural exhibitions in their own localities. It has been the means of stimulating a healthy competitive spirit,

which has reacted to the benefit of the work in general. The benefit of this class of work does not lie so much in the benefit that will be derived in the mere winning of a small amount of cash as a prize, but in the horticultural lessons that will be learned in the production of an article worthy of a prize.

Fruit growing has not as yet been developed on a very extensive scale. The cold winters have militated against it and have limited our scope to the bush, bramble, and the hardiest of tree fruits. Some few pioneers and our Experimental Farms, through the late Director, Dr. Saunders, who was an ardent horticulturist, have done much to arouse an interest in the growing of hardy fruits in Western Canada. Dr. Saunders introduced to the Experimental Farms a number of hardy apples and hardy tree fruits, together with the Pyrus baccata, which has become a valuable stock for grafting purposes and also a good foundation stock for crosses with the hardy standard apples. These hardy crosses, together with other hardy stock introduced from Siberia and countries having similar climatic conditions, have been distributed quite generally for experimental trial.

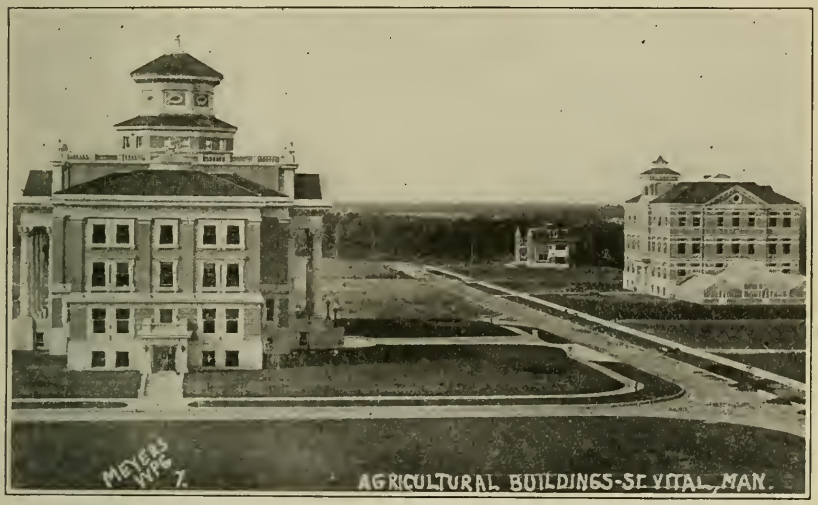
Some few pioneers, among the best known of whom are Mr. A. P. Stevenson, Morden, Manitoba, and Mr. D. W. Buchanan, late of St. Charles, Manitoba, have been responsible for the introduction and distribution of considerable hardy material. We have also been able to make use of some of the valuable Siberian introductions of our friend, Professor Hansen.

The growing of small fruits is carried on to quite an extent in some favored localities. Raspberries, currants and strawberries do very fairly well when given proper care and some protection. Many of the better standard varieties are being tried, and added to these are varieties of more recent introduction produced from local sources or imported from distant points. The growing of fruits in a limited way gives promise in Western Canada.

One of the lines which has been of greatest profit to our people is the policy of free distribution of trees to our farmers, carried on by our Dominion Forestry Branch. This has now been carried on for a number of years, and millions of trees have been distributed in this way, free of charge, for windbreaks and shelter-belts. Two Forestry Farms, one situated at Indian Head, Sask., and one at Sutherland, near Saskatoon, Sask., have supplied this material, which has been distributed for general planting. The system of distribution is followed up by a rigid system

of inspection. Specially trained men are sent out to visit the farms of applicants for trees and an inspection made of the land intended for the purpose, certain requirements in regard to preparation being made before the trees asked for will be sent. This is also followed up by systematic inspection for three years after the trees are planted.

Of deciduous trees sent out, those which have given best results are the cottonwood, Russian and laurel leaved willow, box elder, green ash, white elm, basswood and canoe birch.



Manitoba Agricultural College Horticultural building at the right, with greenhouses in front of it.

Of coniferous trees, the white spruce, Scotch and lodgepole pines, balsam fir and western tamarack, or larch, have been the best. Small stock is invariably sent out, and full instructions as to handling and planting the stock are also sent to the growers.

The demand for this stock has so increased with each succeeding year that the quantity sent to each individual applicant has been reduced each year. The principal object of the work is not governmentel patrimony but a means of stimulating more extensive tree-planting on our western prairies.

Vegetable Growing.—Manitoba offers good opportunities in this line. As we have a rich soil, a quick season and a growing market, despite the fact that we have every year been importing large quantities of vegetables into the Province, the industry has not developed as one would expect. This, to some extent, has been due to the fact that comparatively little effort has as yet

been expended to create specialized markets for our growers, and our scope of markets is less than yours. Facilities for canning and storing will also have to be developed in conjunction with the industry of truck farming to place it upon a sound and permanent basis.

Landscape gardening and floriculture are receiving attention and support throughout our Canadian West. Our towns and cities have borrowed that spirit of civic beautification that has permeated your towns and cities, and an honest effort is being made to make them more attractive horticulturally. The development of splendid civic parks and boulevards has been one of the most valuable lines of work undertaken. The movement has then spread to the homes, and we find a growing interest in the subject of backyard gardening. With this growing interest comes a demand for more information regarding horticultural matters. Everyone wants to know about varieties, systems of culture, and the information gained by our pioneers from long years of experience becomes invaluable.

The interest in home beautification is also being carried to our farms with the result that gradually our farm homes are being made more attractive. The need for work of this kind is just as great in the country as it is in the towns and cities.

On the purely scientific side of horticulture we have not made the progress you have in Minnesota. Your excellent fruit-breeding farm at Excelsior will undoubtedly be the means of developing and encouraging the production of hardy fruits well suited to your local conditions. We in Manitoba have gained much valuable information regarding varieties, but as yet have done comparatively little in the production of new varieties. Dr. Saunder's work in the crossing of apples has done something to stimulate the production of this hardy fruit. The crossing of hardy types and the selection of valuable native stocks will undoubtedly be the means of encouraging the production of fruit throughout Manitoba and the Canadian West.

From a Gardening Standpoint.—I think the selection of more valuable seed stocks in our garden vegetables will also do much to encourage the production of a valuable line of horticultural crops.

The work of the entomologist and plant pathologist has become invaluable to the horticulturist in the production of his crop. We are finding every year that insects and fungous disease are becoming more troublesome, not only to our field crops, but

to those of the garden and orchard. We find that a thorough knowledge of these pests, their life histories and the most successful methods of control are essential to success in practically every line of horticultural practice.

We also realize the importance of the development of a purely western horticultural literature. This should embody the best experience of our practical and experienced men. Together with that should be the experience of our trained scientific men on problems of direct interest to the practical grower. The experience of one is invaluable to the others.

Summing up, I would say that the problems confronting us as horticulturists in Western Canada today are:

1. The development of hardy trees, shrubs, flowering plants and vegetables suitable for western conditions.
2. The development of an exhaustive and reliable western horticultural literature.
3. The development of a greater interest in home and civic beautification.
4. Encouraging the teaching of horticulture, not only in our agricultural colleges but in our high and public schools.
5. A greater degree of experimentation for the purpose of determining better varieties and better methods.

SECRETARY'S CORNER

A CORRECTION.—The very practical article on Rock Gardens, published on the "Garden Flower" page, in the June number of our monthly, was written by Mrs. J. S. Crooks of St. Paul. Through some mistake of the printers—at any rate I am going to lay it on the printers—the name was omitted in connection with the printing of the article, which is much to be regretted.

A VEGETABLE DRYING OUTFIT.—B. F. Sturtevant & Co., of Boston, are sending out a pamphlet describing a plant for drying fruits and vegetables which they manufacture, accompanied by a letter in which they state that this pamphlet was prepared as a result of a request from the United States Department of Agriculture for "information on the possibilities of building a dryer that could be installed in communities," etc. The pamphlet not only describes the dryer and its uses, and is well illustrated, but also gives full details of its cost. As its installation includes all necessary features it exceeds $4,000 and it would of course not be available except for community uses. In these days of urgent appeal to conserve all foods possible, it may be that some of our members would be interested to secure the information referred to in this note. Upon the value of this information of course the writer does not pass, leaving this to the judgment of those who may secure it.

(Continued on page 304)

SUMMER MEETING, 1917.

Minnesota State Horticultural Society.

A. W. LATHAM, SECY.

Another beautiful day greeted the first summer meeting of the society following the semi-centennial anniversary of its organization. A record of approximately twenty-five years, every summer gathering of the society during that period being on a pleasant day, is certainly worth special notice.

The attendance at the meeting was all that could be expected. No attempt was made to keep any record of it; from two to three hundred were in and about the building approximately all the time, a constant stream coming and going from the time the exhibition was opened at noon until 8:30 P. M., when the few flowers that were left which had not been sold for the benefit of the Red Cross fund were turned over to representatives of two city hospitals, who were there to receive them.

Considering the character of the season the exhibition was a most excellent one. The principal feature of these summer gatherings for many years has been the peony exhibit. This year the season being so late many varieties of peonies were not yet in flower, but there were enough there, including roses, perennial flowers, etc., to well fill all of the six tables which had been arranged in the center of the hall and the tables running around the outside walls and also three round tables standing in front of the long center tables. The arrangement of the hall was made by Prof. Cady, of University Farm, who had general charge of matters connected with the meeting, and Mrs. E. W. Gould, the president of the Garden Flower Society, who gave special attention to the arrangement and management of the exhibits. The large number of volunteer assistants, mainly connected with the Garden Flower Society, who had much to do with the installation and care of the various exhibits, and their presence and their readiness to give information, added greatly to the value of the exhibition. If the meeting had been held a few days later the display of peonies would undoubtedly have been larger, but could hardly have been finer.

The very large gymnasium room in which the exhibition was held is especially well adapted for this purpose, being well lighted

from above and affording wide aisle spaces, not too wide, however, for the size of the attendance.

At the noon hour the members of the society and their friends in attendance gathered on the hillside adjoining the gymnasium building, a natural grove which in the past year has been seeded down and has become a nice lawn. Here seated upon benches or grouped on the slope were a host of picnic parties and for an hour and a half this scene was a continuous one. The management supplied plenty of coffee, and those who had come from a distance and were not themselves supplied found plenty of hospitality to take care of their needs.

The regular summer session of the society was convened on this same hillside, benches having been grouped together conveniently for this purpose, at 2 o'clock, with Pres. Cashman in the chair. There were a number of short talks, and one paper on primroses, by Mrs. D. W. C. Ruff. Our old office stenographer, Mrs. Seyferth, was present and took down in shorthand most of what was said, and some of this may be revised and used later in our monthly. Those who spoke were C. S. Harrison, of York, Neb., in his picturesque way presenting the beauties of the flower; Mr. Ernest Meyers, the rose grower of Minneapolis Parks, who talked about roses, varieties and care; Mr. Lee R. Bonnewitz, of Ohio, whose article on peonies in the June number of our monthly attracted so much attention, came from his home on purpose to attend the meeting, and he gave us an inspiring talk of a few moments. His presence with us was greatly appreciated. Others who spoke briefly were: Geo. J. Kellogg, Mr. N. E. Chapman, of the Extension Division; Mr. Clarence Wedge, of the executive board. On account of the age and long years of service of Mr. Harrison and Mr. Kellogg we find a place here for what notes were taken of their talks, in which we feel sure our readers will be interested.

Mr. Kellogg: "Ladies and gentlemen and members of the biggest society in the world, and I am glad to be a member of it; I am glad to be here. For the last year I have been carrying this cane, I am trying to get used to it so that if I ever get old enough to use it I will know how to handle it. I got it in Nevada, Cal., sixty years ago. After your meeting last December I took a straight shoot for Texas, and I stayed in Texas until the twenty-eighth day of May, and I hoed strawberries for two or three months. My boy set out 10,000 strawberries in February. I hoed that three and one-half times, and I hoed a patch of cantaloupe, an acre, twice. So I am not entirely off the hooks yet.

"Perhaps you may want to know something about that Texas climate. It is the finest climate in the world, except that it is

too wet, too dry, too hot, too cold, too windy. Those that live there think it is pretty good, but I have hoed strawberries there when I couldn't hardly stand up for the wind. When the thermometer goes up to 95° I go to the house. I hoed one day until it was up to 93°, the wind blew so hard I had to look at the thermometer. I think if I was going to stay there I would carry a thermometer in my pocket. Folks that live down there think it is all right, and I would if I lived there. I like Wisconsin winters, and I like Wisconsin summers. I have spent three winters in Texas; Texas climate has not improved a bit. I was there five years ago last December when the whole country was wild on the orange question, the Satsuma orange. In January we had a freeze there that killed everything, contracts and even the men interested in them. Last year they had a good crop of oranges, but there came a frost in November that spoiled half of the crop that was on the trees, and they mixed the bum ones with the good ones and didn't get enough to pay for picking. The fig business is also done up, that is, winter-killed.

"They make a great fuss about raising garden products. My boy is quite heavy in the chicken business, his wife hatches about 4,000 chicks a year, and that is where they get their money. You can't grow alfalfa in that part of the country, you can't grow timothy or clover. The whole country is just level or flat, only nine inches of fall in eight miles from there to the gulf, and a rain of six inches would flood the whole country. I might get back there to see some more rainfall, but I like Wisconsin winters the best. A year ago last winter I spent in Minneapolis, the finest winter I ever spent. I thank you."

Rev. C. S. Harrison: "Friends, the time is coming and now is when people will realize that it is just as necessary to raise a peony as a potato. The vegetable garden feeds the body, the flower garden feeds the soul. Which is the more important? I leave it with you. Many a poor woman on the frontier who has had plenty of potatoes has had her soul almost starved for the beautiful. She wanted flowers, and she couldn't have them, slowly she pined away—her heart starved. Now so long as the immortal in us is worth more than the mortal, which we must lay aside, we have got to minister to the best part of us and do the best we possibly can for ourselves. We are only just beginning to comprehend the mission of flowers, the tremendous influence which they have on the human heart and human soul adjusted to this great hunger for something beautiful, and it hasn't always been satisfied.

"Mrs. Alexander, the great missionary's wife, saw a woman looking very stubborn and indifferent to religious matters, and she wanted to speak to her. So she went out and bought a beautiful bouquet of pansies and came back and said to her: 'Perhaps you would enjoy this bouquet of flowers.' Her heart melted and then they could talk together.

"Jacob Reis, a companion of Roosevelt, did a great deal of work in building up the slums of the cities. He told one of the leading citizens that he could do more with an armful of flowers

than he could do with the policemen. There was a great love for the beautiful which needed cultivation. I had a friend who wanted to beautify the railroads all the way into Boston. People told him when he got that far the hoodlums there would tear up everything. When he got into the city he commenced planting flowers and the children would come out and look on, and he said, 'We are working for you. The rich people have their gardens and everything they want. These flowers are yours, they are for you, you mustn't touch them nor let any one else touch them.' It was a great revelation. Let anybody touch one of those flowers and they would have a hard time of it. They would have a troop of wild cats after them. I mention this to let you know the absolute necessity of cultivating the beautiful.

"There is a mission indeed in the beauty which God has created, these gardens of precious jewels, the diamond for the stars, the sparkling emerald for the greenness, the sapphire, gathering in all the blueness of the heavens, and all of these other gems of priceless value. Did you ever realize that He who planted this earth and covered it with beauty also landscaped the heavens. Just think what has been done. Here is a piece of earth. You plant a few peonies and a few iris, and the invisible artist takes the dull brown earth for his study, and out of this barrenness and blackness such tints are evolved. It's God working with you, and these things so beautiful are symbolical of what lies beyond us. They are revealing to us the glory of what will be. I think of the arch over which is written, 'Well done, good and faithful servant, all these are yours.' The gardens of God are beautified and glorified for you and for me."

There were a number of other visitors from abroad and those whose names come to the writer were Mrs. Crawford, of Indiana, and Mr. Good of Good & Reese, Springfield, Ohio. All of these visitors whose names are mentioned were there for the purpose of seeing the peony exhibit. Their presence will undoubtedly be a stimulant to increase the scope and value of peony exhibits to be made by the society in coming years.

Many ladies in attendance gave their time from early forenoon till the closing hour in sale of flowers for the Red Cross fund. These were not primarily flowers on exhibition, but were contributed by the exhibitors for this purpose—and there were loads of them. We have no record of the amount, but they occupied a room adjoining that where the regular display was made and constituted a large exhibition by themselves. One contributor brought in, we understand, 1,000 peonies, and many others a considerable amount. The total sales for this fund amounted to $117.62.

Pleasant weather, and a pleasant day, and a kindly word, and a greeting of smiles and joy filled the day, which passed ever so pleasantly, and which we expect will be repeated year after year as the society shall get together for its annual summer picnic.

Award of Premiums, Summer Meeting, 1917.

ROSES.

Collection, amateurs, Mrs. H. B. Tillotson, Minneapolis, first premium, $5.00.
Three named varieties, white, Mrs. H. B. Tillotson, Minneapolis, second premium, $1.00.
Three named varieties, red, Mrs. H. B. Tillotson, Minneapolis, first premium, $2.00.
Three named varieties, white, Mrs. H. B. Tillotson, Minneapolis, first premium, $2.00.
Collection, amateurs, Mrs. G. T. Brown, St. Paul, second premium, $3.00.
Three named varieties, pink, J. A. Weber, Excelsior, first premium, $2.00.
Three named varieties, red, J. A. Weber, Excelsior, first premium, $2.00.
Collection, Thos. Redpath, Wayzata, third premium, $1.00.
Most beautiful, Mrs. H. B. Tillotson, Minneapolis, first premium, $1.00.
Largest rose in vase, Mrs. H. B. Tillotson, Minneapolis, first premium, $1.00.
General Jacqueminot, Thos. Redpath, Wayzata, first premium, 75c.
Madam Plantier, Thos. Redpath, Wayzata, first premium, 75c.
Grus an Teplitz, Thos. Redpath, Wayzata, first premium, 75c.

AUG. S. SWANSON,
J. M. UNDERWOOD,
Judges.

PEONIES.

Flesh or light pink, Mrs. Frank Moris, St. Paul, second premium, $1.00.
Medium or dark pink, Mrs. Frank Moris, St. Paul, second premium, $1.00.
Red, Mrs. Frank Moris, St. Paul, second premium, $1.00.
Medium or dark pink, D. W. C. Ruff, St. Paul, first premium, $2.00.
Light pink, Clarence L. Empy, Eureka, third premium, 50c.
Dark pink, C. L. Empy, third premium, $2.00.
Festiva Maxima, D. W. C. Ruff, St. Paul, second premium, $1.00.
Flesh or light pink, D. W. C. Ruff, St. Paul, first premium, $2.00.
White, D. W. C. Ruff, St. Paul, first premium, $2.00.
Red, D. W. C. Ruff, St. Paul, first premium, $2.00.
Festiva Maxima, Mrs. J. M. Haas, St. Paul, third premium, 50c.

JOHN E. STRYKER,
LEE R. BONNEWITZ,
Judges.

Collection, three blooms, amateur, Mrs. Frank Moris, St. Paul, second premium, $4.00.
Collection, three blooms, amateur, Mrs. H. B. Tillotson, Minneapolis, first premium, $6.00.

A. M. BRAND,
D. W. C. RUFF,
H. F. BAKER,
Judges.

ANNUALS AND PERENNIALS.

Dielytra, F. H. Ellison, Minneapolis, third premium, 50c.
Delphinium, F. H. Ellison, Minneapolis, third premium, 50c.
Forget-me-nots, F. H. Ellison, Minneapolis, first premium, $1.50.
Gaillardias, F. H. Ellison, Minneapolis, second premium, $1.00.
Grass Pinks, F. H. Ellison, Minneapolis, third premium, 50c.
Canterbury Bells, J. A. Weber, Excelsior, first premium, $1.50.
Columbine, J. A. Weber, Excelsior, first premium, $1.50.
Columbine, Harry Franklin Baker, Minneapolis, second premium, $1.00.
Delphinium, Harry Franklin Baker, Minneapolis, second premium, $1.00.
Forget-me-nots, Harry Franklin Baker, Minneapolis, third premium, 50c.
Gaillardias, Harry Franklin Baker, Minneapolis, first premium, $1.50.
Grass Pinks, Harry Franklin Baker, Minneapolis, first premium, $1.50.
Canterbury Bells, Mrs. S. A. Gile, Minneapolis, second premium, $1.00.
Foxgloves, Mrs. J. F. Fairfax, Minneapolis, first premium, $1.50.
Dielytra, Mrs. F. Tereau, St. Paul, second premium, $1.00.
Evening Primrose, Mrs. G. C. Hawkins, Minneapolis, first premium, $1.50.
Centaurea, Harry Franklin Baker, Minneapolis, second premium, $1.00.
Forget-me-nots, Vera P. L. Stebbins, Minneapolis, second premium, $1.00.
Gaillardias, Vera P. L. Stebbins, Minneapolis, third premium, 50c.
Centaurea, Mrs. Frank Moris, St. Paul, first premium, $1.50.
Columbine, Mrs. Frank Moris, St. Paul, third premium, 50c.
Dielytra, Mrs. Frank Moris, St. Paul, first premium, $1.50.
Delphinium, Mrs. Frank Moris, St. Paul, first premium, $1.50.
Grass Pinks, Mrs. Frank Moris, St. Paul, second premium, $1.00.
Canterbury Bells, Mrs. H. B. Tillotson, Minneapolis, third premium, 50c.
Foxgloves, Mrs. H. B. Tillotson, Minneapolis, second premium, $1.00.
Sweet William, J. A. Weber, Excelsior, third premium, 50c.
Iceland Poppies, F. H. Ellison, Minneapolis, second premium, $1.00.
Annual Poppies, F. H. Ellison, Minneapolis, first premium, $1.50.
Pansies, F. H. Ellison, Minneapolis, first premium, $1.50.
Perennial Coreopsis, F. H. Ellison, Minneapolis, third premium, 50c.
Shasta Daisies, F. H. Ellison, Minneapolis, third premium, 50c.
Oriental Poppies, Mrs. E. W. Gould, Minneapolis, second premium, $1.00.
Perennial Coreopsis, Mrs. G. C. Hawkins, Minneapolis, second premium, $1.00.
Pyrethrum, Mrs. G. C. Hawkins, Minneapolis, first premium, $1.50.
Sweet William, Mrs. G. C. Hawkins, Minneapolis, first premium, $1.50.
Iceland Poppies, Harry Franklin Baker, Minneapolis, first premium, $1.50.
Pyrethrum, Harry Franklin Baker, third premium, 50c.

ANNUALS AND PERENNIALS—Continued.

Lupine, Harry Franklin Baker, Minneapolis, first premium, $1.50.
Oriental Poppies, Harry Franklin Baker, third premium, 50c.
Sweet William, Harry Franklin Baker, Minneapolis, second premium, $1.00.
Lilies, Mrs. S. A. Gile, Minneapolis, second premium, $1.00.
Iceland Poppies, Mrs. J. F. Fairfax, Minneapolis, third premium, 50c.
Lilies, Mrs. Frank Moris, St. Paul, third premium, 50c.
Annual Poppies, Mrs. Frank Moris, St. Paul, second premium, $1.00.
Oriental Poppies, Mrs. Frank Moris, St. Paul, first premium, $1.50.
Pansies, Mrs. Frank Moris, St. Paul, second premium, $1.00.
Pyrethrum, Mrs. Frank Moris, St. Paul, second premium, $1.00.
Shasta Daisies, Mrs. Frank Moris, St. Paul, first premium, $1.50.
Lilies, Mrs. H. B. Tillotson, Minneapolis, first premium, $1.50.
Annual Poppies, Mrs. H. B. Tillotson, Minneapolis, third premium, 50c.
Perennial Coreopsis, Mrs. H. B. Tillotson, Minneapolis, first premium, $1.50.
Shasta Daisies, Mrs. H. B. Tillotson, Minneapolis, second premium, $1.00.

C. E. CARY,
J. A. JANSEN,
Judges.

IRIS.

Collection, F. H. Ellison, Minneapolis, first premium, $3.00.
Collection, Rainbow Gardens, St. Paul, second premium, $2.00.
Collection, Harry Franklin Baker, Minneapolis, third premium, $1.00.

W. E. FRYER,
E. MEYER,
Judges.

COLLECTIONS OF ANNUALS AND PERENNIALS.

Collection, perennials, Mrs. Frank Moris, St. Paul, fourth premium, $1.00.
Collection, annuals and perennials, Mrs. F. Tereau, St. Paul, first premium, $4.00.
Collection, perennials, Harry Franklin Baker, St. Paul, third premium, $2.00.
Collection, perennials, J. A. Weber, Excelsior, first premium, $6.00.
Collection, perennials, F. H. Ellison, Minneapolis, second premium, $4.00.

MRS. D. W. C. RUFF,
MRS. H. A. BOARDMAN,
Judges.

WILD FLOWERS.

Wild Flowers, Mrs. F. Tereau, St. Paul, third premium, $2.00.
Wild Flowers, Illa Koerner, St. Paul, first premium, $4.00.
Wild Flowers, Miss Flora Moeser, St. Louis Park, second premium, $3.00.

MARY G. FANNING,
CLARA K. LEAVITT.
Judges.

GARDEN FLOWERS.

Basket of flowers, Mrs. J. F. Fairfax, Minneapolis, second premium, $2.00.
Basket of flowers, Mrs. E. W. Gould, Minneapolis, third premium, $1.00.
Basket of flowers, Illa Koerner, St. Paul, first premium, $3.00.
Vase, artistic effect, F. H. Ellison, Minneapolis, second premium, $1.00.
Vase, artistic effect, Mrs. H. A. Boardman, St. Paul, third premium, 50c.
Vase, artistic effect, Vera P. L. Stebbins, Minneapolis, first premium, $1.50.

M. E. ROBERTS,
FLORENCE D. WILLETS,
Judges.

Vase, any kind of flowers, Mrs. Frank Moris, St. Paul, third premium, 50c.
Vase, any kind of flowers, Miss Marjorie Knowles, St. Paul, second premium, $1.00.
Vase, any kind of flowers, Miss Flora Moeser, St. Louis Park, first premium, $2.00.

J. A. JANSEN,
C. E. CAREY,
Judges.

STRAWBERRIES.

Progressive, H. G. Groat, Anoka, first premium, $1.00.
Best named variety (Advance), Wm. Ritchell, Minneapolis, first premium, $2.00.
Minnesota No. 3, P. Clausen, Albert Lea, third premium, 50c.
Superb, P. Clausen, Albert Lea, third premium, 50c.
Americus, P. Clausen, Albert Lea, first premium, $1.00.
Dunlap, Illa Koerner, St. Paul, second premium, 75c.
Minnesota No. 3, J. F. Bartlett, Excelsior, second premium, 75c.
Dunlap, J. F. Bartlett, Excelsior, first premium, $1.00.
Collection, three named varieties, Clarence L. Empy, Eureka, first premium, $3.00.
Bederwood, Clarence L. Empy, Eureka, first premium, $1.00.
Seedling, Clarence L. Empy, first premium, $3.00.
Collection (not less than six varieties), Clarence L. Empy, Eureka, first premium, $5.00.
Progressive, A. Brackett, Excelsior, second premium, 75c.
No. 3, A. Brackett, Excelsior, first premium, $1.00.
Seedling, A. Brackett, Excelsior, second premium, $2.00.
Minnesota No. 3, Thos. Redpath, Wayzata, fourth premium, 25c.
Progressive, Thos. Redpath, Wayzata, third premium, 50c.
Best named variety (Onward), P. Clausen, Albert Lea, second premium, $1.00.
Seedling, P. Clausen, Albert Lea, third premium, $1.00.

GEO. J. KELLOGG, Judge.

Irises for Minnesota.

Bearded Irises	Dwarf Crimean Irises. 50 varieties.	6-15 inches. March-April-May. Edgings and rock gardens.
"Germanicas"	Intermediate. 30 varieties.	12-18 inches. Late April-May.
Sunny or shady location (Like lime.)	Tall. Over 400 varieties.	15-36 inches. May 20-July 5.
Beardless Irises (Do not like lime except where noted.)	For dry locations. 10 varieties.	3-12 inches. May-June-July. Edgings and rock gardens.
	Siberian Irises. 20 varieties.	2-5 feet. June-July.
	For borders and waterside. 15 varieties. Like lime.	Spurias. 1-5 feet. June-July.
	Water Flags. 10 varieties.	2-3 feet. Watersides or in water.
	Japanese Irises. Over 75 varieties.	1-4 feet. Late June-July-August.
Bulbous Irises (Like lime.)	Dutch.	May.
	Spanish.	Late May and June.
	English.	June and July.

In my opinion, perennials should form the foundation of every garden, and in particular three perennials should predominate—Irises, peonies and phloxes. Of these three perennials the Irises have certain advantages over the other two, of which I will tell you more fully later.

The Iris is called the "outdoor orchid," but the flower of the Iris is more delicate and is easier to grow. In certain respects, however, it is like the orchid, in that the different varieties have been gathered from practically every part of the world. The native place of a large part of the Iris family, however, is southern Europe and central Asia.

It is unusual, you may believe, that a flower should have a history, but this is true of the Iris. The Iris was the symbol of hope in early Greece and as such was used to decorate their graves. In Egypt it was the symbol of power and was carved on the brow of the Sphinx. In France it has always been the flower of royalty and from early times was engraved into the arms of France. In Japan the Iris is reverenced, and the month of June is known as the month of the Iris, when it is used to decorate their houses and public conveyances.—J. S. Crooks.

(Continued in August number)

N. W. PEONY AND IRIS SOCIETY.

W. F. CHRISTMAN, Secretary.

3804 Fifth Avenue South, Minneapolis, Minn.

Our first annual exhibit of peonies and iris, held in conjunction with the State Horticultural Society and the Minnesota Garden Society, proved a success, but the writer must confess that he was considerably disappointed with the display of peonies. Not that there were no peonies shown, but we would like to have seen more exhibits displayed. Many beautiful peonies were shown that attracted the attention of hundreds of peony lovers from the time the show was opened to the public until the doors were closed at night.

Some very beautiful iris were displayed by Mr. A. C. Arny, of St. Paul, that inspired many to a fuller appreciation of this beautiful flower. Mr. Willis E. Fryer, of Mantorville, also displayed many varieties that were new. Owing to the advanced season the iris had passed its best season of bloom, or at least many varieties had. Mr. John S. Crooks also exhibited several varieties. The Park Board also showed a number of varieties, together with a collection of peonies. Many of our members possess fine peonies who did not display due to the fact that they had given their entire lot of blooms to the Red Cross.

Mr. Ruff carried off the honors in the professional class, winning first prize on LeCygne, the best white; Therese, the best flesh or light pink; Ruy Blas, the best dark pink; and Karl Rosenfield, the best red.

Mrs. Tillotson carried off first prize in the amateur class for the best display of varieties. Due to a misunderstanding there were no entries in competition for the silver medal offered by the National Peony Society, which is to be regretted, and if this offer holds good next year, as we are hoping it will, your secretary can give assurance that there will be a lively contest for this medal. We have learned many things that will assist us in our next year's exhibition and trust that each of our members will resolve at this time to exhibit next year, as this will create more interest and enthusiasm in the work we are endeavoring to accomplish.

Mr. A. M. Brand, of Faribault, exhibited many fine seedlings of great merit. Some of them have recently been named. Among them the writer noticed Faribault, a splendid flower, as well as many others. We are indebted greatly to the Brands for their efforts and painstaking care in producing new varieties, for what lover of rare peonies is not familiar with Martha Bulloch, Mary Brand, Judge Berry and a score of other splendid sorts. Mr. Brand's exhibit was devoted exclusively to seedling varieties of his own origination that had never before been exhibited.

There was no one flower on exhibition that called for more favorable comment than the variety exhibited as Laverne by the writer. This variety was not entered in competition but simply was on display, as was a splendid table supplied with flowers by A. B. Franklin, of Minneapolis. Mr. Franklin also supplied several hundred splendid blooms to the Red Cross Society, which were readily sold. Mr. C. J. Traxler, of Minneapolis, displayed several fine varieties, among them "Jubilee." He also exhibited a seedling which attracted considerable attention on account of its brilliant red color, its fragrance and crinkled petals, a very unusual feature in a red peony.

We were delighted to meet several of our out of town members. Mr. Bonnewitz gave a very inspiring talk that was greatly enjoyed by all those who had the pleasure of hearing him. To show that peonies could travel long distances without injury, he brought four vases of splendid bloom from Van Wert, Ohio, his home, that looked as fresh as though they had just been plucked from his garden that morning. They were carried over 600 miles, however, and this should be an incentive to those of our members who are located a considerable distance away, and should inspire them to try and do as well and make a display next year.

Mr. and Mrs. John M. Good, of Springfield, Ohio; Mrs. Crawford, of La Porte, Ind., and Dr. and Mrs. Knapp of Evansville, Ind., were also with us, and many others whom your secretary did not have the pleasure of meeting.

SECRETARY'S CORNER.

(Continued from page 295)

Secretary's Office Hours.—During the months of July and August the secretary's regular office days will be Mondays, Wednesdays and Fridays, although he is likely to be in the office on other days as well. Except for a period of two weeks, beginning July 4th, the office will be open every day, both forenoon and afternoon, except Saturday afternoon. Although you may not find the secretary in, you will always find the assistant there, and matters connected with the work of the society will receive the usual attention.

Horticultural Periodicals for Free Distribution.—A considerable number of periodicals representing the various branches of horticulture in this country are received in this office. Most of them are of a size and character that it does not seem worth while to bind them up for permanent preservation, but we hate to throw them in the waste basket as we would have to do if our friends do not take them away. When in the city and needing good reading on fruit-growing, vegetable gardening, flower culture, etc., please call at this office and take away an assortment of these periodicals. You will find something to interest you in every branch of horticulture.

Minnesota Apple Crop.—Reports that have come into this office from various localities in the state, and especially from the southern one-third of the state, where most of the profitable apple growing is being done, indicate that there will be a fair crop of apples, though not quite as many as we anticipated considering that so many of the trees were not productive last year. An effort to predict the apple crop now is largely in the nature of a guess, but we venture to put it somewhere between sixty and seventy per cent of a full yield. There has been some winter-killing of trees, even Wealthys about Lake Minnetonka and in some other localities have suffered somewhat, but the extent of the injury is after all comparatively unimportant.

Are Your Hybrid Plum Trees Fruiting?—A number of varieties of hybrid plum trees originated at the State Fruit-Breeding Farm have now been in the hands of our members for two or three years, and under favorable conditions many of them are likely to be fruiting this year. We should be very glad if members who have such trees bearing this season would report on the hardiness and success of the trees and the quality of the fruit. Occasionally perhaps some member may wish to send by parcel post a few specimens. In all cases, please give the number of the tree by which it is designated by the Fruit-Breeding Farm, which number accompanied the tree when delivered to you.

Loring's Plum Prize.—Several years ago Charles M. Loring, of Minneapolis, placed in the hands of the society $100 to be awarded to the originator of a plum worthy of such a prize. At intervals since then, plums have been sent in to this office by contestants for this prize, but none seem to be sufficiently valuable to receive it. We call your special attention to this that it may not be overlooked, as any season such a plum may appear amongst the thousands of plum seedlings that are being grown by members of this society and others. Application for this prize should be accompanied by a description of the tree, and specimens of the plum should be sent to this office. Plums must be gathered before they are fully ripe as to insure their transportation in a condition to be passed upon.

The Society Library.—This is a very valuable element of the properties of the society which are open to its membership. It not only includes hundreds of books of practical value in all branches of horticulture, to say nothing of the much greater number of reports of similar societies, of which we have a very complete file—but besides this we have a large proportion of the bulletins issued by the experiment stations of the country, covering all subjects directly and indirectly relating to any branch of horticulture. These bulletins are filed in cases, and as we have a card index of them, classified by subjects, they are readily accessible, so that any subject that one desires to study, whatever there is bearing upon it in our file can be found at once. The society library and its accessories are not used as much as they should be.

IN THE GROVE AT THE 1917 SUMMER MEETING.

Rev. C. S. Harrison speaking—over the X. Glimpse of the Gymnasium, where the exhibition was held, at the right.

While it is not the intention to publish anything in this magazine that is misleadng or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 AUGUST, 1917 No. 8

Primrose Auricula, Polyanthus.

READ AT SUMMER MEETING BY MRS. D. W. C. RUFF, BALD EAGLE LAKE.

For five or six years I have grown the primrose, the hardy varieties, and most of them from seed, until my plants number hundreds, making my border gay with their blossoms in late April and May, a new variety blooming as late as June 27.

Frances Edge McIlvaine, of Pennsylvania, in "Women's National Farm and Garden Magazine," asks this question: "Are there not other gardeners who have heard the call of the primroses? If they live in China or California, will they not make the beginning of a *Primrose Path,* from east to west, so that our spring may soon be gay with these new and wonderful varieties?" Mrs. McIlvaine's article on the primrose is so interesting!

Another article is "The Charming Hardy Primroses," by H. S. Adams, of Connecticut, in which he says, "Few realize how easy it is to grow the hardy garden primroses, fewer still have any idea of the variety and beauty that this race of plants lend to the border in springtime."

Our eastern friends agree on the charms of these plants but do not know that we can be successful in growing them here in Minnesota. They find them "delightfully interesting to cultivate, and one could not wish for a longer lived plant for the middle Atlantic States. Plant colonies have lived in a certain New Jersey garden for over a hundred years, and in southern Pennsylvania they flourish quite luxuriantly," still quoting from these articles.

These words apply to our plants. Perhaps the more tender varieties may be difficult to raise, but not the varieties elatior, polyanthus, veris, cowslip, vulgaris, the English primroses and

the hybrid from choice seed, the beautiful new Munstead, loved by Mrs. Francis King, of Michigan.

I have been asked to speak this afternoon of a perennial plant and have taken this race of plants because they are so little known here in the Northwest. I proclaim that they are hardy, raise my voice for them—and for other perennials which are considered of doubtful hardiness. I can answer the call of the primrose, having made a beginning of the Primrose Path in Minnesota, of which I hope others will join with me in the making, and extend this path towards the path already started.

Fig. 1.

Fig. 2.

Fig. 3.

Primroses are beautiful in front and among tulips as in pictures one and two, and the blue of the Scilla, No. 3, blends with their colors of orange, pale yellow, maroon, laced with gold.

Primrose auricula, and the other name, polyanthus, is described as "plants with pale green foliage in a rosette, or tuft, flowers in dense clusters on stout, leafless stems, which rise high—some low—above this tuft of leaves. The foliage is beautiful. Some appear as dusted with powder, which gives them a silvery appearance.

The flowers come in clusters, or umbels, often globe shaped clusters, carried high above the plants in shades of yellow, brown, red, pink and white. I am not speaking of the half hardy (white) varieties which require the experienced care of a collector, but let us start with those easy to grow, then later enlarge the collection to include those from China and India.

I find the greatest pleasure in growing them from seed planted in June. Be patient as they are slow of germination, often taking twelve months to come up. So plant the seeds where they may remain, uutil the following spring. Over these seedling plants place a covering of leaves (do not use manure) not too heavy a covering, as they need air—tuck the leaves around and among the plants.

Some of my plants are grown in full sun, but the plants which attained perfection were in partial shade, the north side of the border. If grown in a situation too warm for them to remain all summer they may be lifted after blooming and planted elsewhere to be brought back in the fall for the gay spring border. They may even be taken up when in full bud or bloom and used in window box or for the house.

"They do best where they have a rise of ground to insure good drainage, and are kept from drying out in summer, also they enjoy a rich, light soil," not planted deep enough to cover the crown. They may be divided by pulling the plants (little tufts, or crowns) apart, in August or early September if not too hot. Where at first you had one plant, now you will have two or three. So come with me and plant these new little plants in that Primrose Path in Minnesota.

TREES PLANTED BY MACHINE.—A machine which plants from ten to fifteen thousand forest tree seedlings a day is now being used at the Letchworth Park Forest and Arboretum, in Wyoming County, N. Y., according to officials of the Forest Service who are acting as advisers in the work. Previously the planting had been done by hand at the rate of 1,200 to 1,500 trees each day per man.

The machine was designed to set out cabbage and tomato plants, but works equally well with trees. It is about the size of an ordinary mowing machine and is operated by three men and two horses. One man drives the team while the other two handle the seedlings. The machine makes a furrow in which the trees are set at any desired distance, and an automatic device indicates where they should be dropped. Two metal-tired wheels push and roll the dirt firmly around the roots. This is a very desirable feature, it is said, because the trees are apt to die if this is not well done. Two attachments make it possible to place water and fertilizer at the roots of each seedling. Another attachment marks the line on which the next row of trees is to be planted.

No cost figures are available yet, but officials say that the cost will be much less than when the planting is done by hand. It is stated that the machine can be used on any land which has been cleared and is not too rough to plow and harrow.—U. S. Dept. Agri.

Home Canning.

MRS. L. M. GLENZKA, HOPKINS.

Taking care of the waste crop. God has a great work for us in His field; we are His stewards. Every year, I am sure, one-half of each crop is wasted, not wilfully, just being unable to market it because there is not enough to pay for the time of hauling, and it is left to waste. Then the average farmer, say nothing of the city gardener, buys canned goods the rest of the year. There is a great demand for every fruit and vegetable. If you do not believe it let me instruct you how to can this waste crop, and I will sell as many thousand cans as you can can. This is the only way in which to keep carrots, beets, spinach, beet greens, chard, peas, beans and all other vegetables and fruit in a fresh state and ready to serve in a few moments. Carrots, no matter how well they are packed, have not the flavor in the winter that is to be had in the early part of the season, also beets. Canning is very successfully and easily done. One day will care for the crop each week on the average farm. Mr. Glenzke and I have canned as high as twenty bushels of tomatoes in a day. An ordinary bushel will fill from twenty to twenty-five quarts, a very poor bushel might not fill more than fifteen cans. When you have to peel off the out-side, and then dig out a black core, as we did two seasons back, it does not leave much for the cans. Any fruit well peeled and all bad parts removed is just as good as the best fruit when it is in the cans. Anyone can sell a good bushel of tomatoes for $1.50, the culls at 10c per can, and twenty-three cans will make $2.30. Three cents per can is 69c, leaving you $1.61 for your culls.

It takes one day to get the load ready for market, and another to take it to market, and the next day everyone knows you are all tired out. If that much time had been taken in canning, the chores would not have been neglected, at least one day's haying could have been done, the only difference would be your money would all come in at one time when the can goods would be sold. You would have to invest in cans, but your returns would be much greater than the fresh products. And another fact is, the best fruit peels easier than the culls; I feel this is sufficient argument. I would have been glad had some one told me how many cans I could get out of a bushel and how much the cans were to weigh. This I had to find out by experience—also I bought a canner, which is not necessary. It is much more important to have fruit

and vegetables to can than a canning outfit, and to this day I do not own a capping steel, and our cans are soldered very well. Raise fruits of all kinds and vegetables also, and live off the fat of the land.

I will now tell you how long to cook different fruits and vegetables:

HOME CANNING.

In home canning we need a soldering copper, which is used for soldering the caps on cans, tipping, or in other words, soldering the vent hole. To use heat the soldering copper in the firepot, wipe cans clean; put on the caps, and use flux brush; wet all around the edge of caps (in the groove) with the soldering flux. When the soldering coppers are hot enough, then solder on the caps.

Should it be a fruit or vegetable that is to be processed, instead of exhausted and processed, then solder the vent hole at the same time.

If the soldering copper becomes too hot, it will burn off the tin, or in time wear off. When this occurs, heat the copper red hot; clean off the surface with a coarse file, dip in the bowl of soldering fluid to clean it, and then rub over the filed surface with solder. This will turn it bright and clean. If the copper gets out of shape, from use and dressing, it can be hammered into shape while red hot.

In ordering cans, you should specify that you want solder hemmed caps, as the solder is already applied on the caps, and is very easily soldered by using the soldering flux, and running copper around the caps, and your cans are then soldered.

EXHAUSTING.—When fruit and vegetables are to be exhausted before processing, the water should be one inch from the top of cans.

PROCESSING.—Boiling the cans of fruit or vegetables is called processing. Always have the water tank at a boiling temperature. The fruits or vegetables that are not to be exhausted will stop the water from boiling on account of their being cold. If air bubbles arise from any of the cans it denotes a leak, and the cans must be taken out and mended by using the tongs for that purpose, and when the cans are mended put them back in the water.

Different varieties of fruit and vegetables require different times for the processing or boiling. ALWAYS COUNT THE TIME FROM THE MOMENT THE WATER BEGINS TO BOIL AFTER CANS ARE IN THE TANK.

CANS TOO FULL.—Do not fill the cans so full that the fruit or water will touch the top of can where it is to be soldered. If you do you will have trouble to solder the cap on, as the hot iron will cause the water to boil and keep the solder from adhering to the tin.

TO MEND A LEAK.—The bubbles in the water will locate a leak in the can. Mark this place by scratching it with a sharp piece of steel. Place the can on the table, punch a small hole in the can near the leak, then put some flux on the leaking place and solder with solder copper, then solder the hole made with the steel.

Sometimes the leak is so small that it will not show bubbles in the water until the time of taking the cans out, or after they are done. This we call a HOT LEAK. Let the can cool for five or ten minutes, then mend as described above. Put the can back and boil five minutes.

RECIPES FOR CANNING.

TOMATOES.—Use nothing but sound, ripe stock. First put in the scalder—that is, the screen tray, which has a false bottom, that it can be used for processing when scalder is not in use. Let the tomatoes remain in the boiling water about a minute, or until the skin loosens, then remove the skin, which comes off easily. Cut out any hard core, fill cans full, putting tomatoes in by hand. Use care so as not to break them. As each can is filled, place it in the tray, and when tray is full wipe the cans clean with a damp sponge. Then cap as directed under head of capping. Place tray full of cans in tank and process for forty minutes, counting the time from the time the water in the tank commences to boil. The weight of cans, No. 2, 23 oz.; No. 3, 37 oz., and No. 10, 118 oz.

CORN.—Cut the corn while in a milky state. Husk clean. Now, do not cut too close to the cob, but scrape off cob with back of knife. Put teaspoonful of salt in can, then put in the corn until nearly full and pack it down. Fill up with clean, cold water, then cap the can, exhaust for seven or eight minutes, then solder the vent hole, place back in the water and process five hours. The quicker it cools the better. No. 2 can should weigh 23 oz.

PEAS.—Use tender stock. Hull and place them in the screen tray, dip into boiling water for four minutes. This shrinks the peas and turns the old and tough ones yellow; the latter must be picked out. After shrinking put into cans, fill them about three-fourths full, fill up with hot water and exhaust seven or eight minutes, and process three hours. Put a teaspoon of salt in can before filling with peas. It is advisable to dip peas in cold water after blanching in a small percentage of alum water to harden the peas and set the green color.

LIMA BEANS.—Same as corn except that hot water may be used instead of cold.

STRING BEANS.—Use tender stock, blanch or shrink same as peas, also process same as peas.

PUMPKINS AND SQUASH.—Cut the pumpkin and squash (after peeling) into small blocks, put them into the tomato scalder and boil until soft. Mash up fine, filling the cans quite full. Exhaust ten minutes and process five hours.

BEETS.—Gather them while young and tender, boil until peeling comes off easily, pare and slice in quarters and pack in cans, using cold water to fill in. Process fifty minutes. The tin cans take the color out of the beet—would recommend glass jars.

SAUER KRAUT.—Make your kraut and let it stand from six to ten days until it is as sour as you like, then pack in cans until the cans are full and the water rises so as to cover it. Exhaust ten minutes and process twenty minutes.

PEACHES.—To remove skin from peaches, to each gallon of water, add one tablespoonful of washing soda (sal soda). This is not potash and will not injure the peaches in the least. Place peaches in wire basket, dip in the above solution for thirty seconds—not to exceed forty-five seconds. After taking peaches from this solution use rough rag, and the peach skin will be removed; then place peaches in cold water. Use firm, solid fruit, not too ripe. Cut in halves, remove the seeds, put in cans as soon as possible, first putting granulated sugar in the bottom of cans; fill with clean hot water; cap and process for fifteen minutes.

PEARS.—Ripe fruit, not soft. Cut in halves, peel and take out cores, cans full, and fill with hot water. Process same as peaches and cool quickly. Sweeten to taste.

APPLES.—Sour apples are best. Peel and slice or quarter. Sugar to taste and fill can with hot water. This fruit is so light that the cans will float in processing unless weight is on top to hold them down. Process fifteen minutes.

CHERRIES.—May be canned whole or seeded. Cans full, add sugar and hot water. Process twelve minutes in No. 2 cans.

STRAWBERRIES.—Pick over the fruit, fill cans, add sugar and cold water, tip and solder; process twelve minutes in No. 2 cans.

RASPBERRIES, BLACKBERRIES, GRAPES AND PLUMS the same as CHERRIES and STRAWBERRIES.

ASPARAGUS TIPS.—Cut tips from stocks, wash thoroughly in cold water, blanch about two minutes, fill cans and pour on very mild salt water. Cap, tip and process forty minutes.

SAUSAGE.—Sausage can be kept in two oz. cans until midsummer if exhausted ten minutes and processed one hour.

POULTRY.—Boil poultry until you can take it off bones, season to taste, pack cans, put on gravy, exhaust eight minutes and boil three hours.

MOTHER'S PICKLES.—One peck of green tomatoes, one dozen onions, one-half dozen green peppers. Slice all, sprinkle with one cup of salt and let stand over night. In the morning drain, put in the kettle with vinegar to cover, add about two cups of sugar, whole spices and cook until tender. Seal hot in jars or put in tin cans and process fifteen minutes.

CORN RELISH.—This makes four quarts. Eighteen large ears of corn, one cabbage, four large onions, three red peppers, chop all together; 1¼ pounds light brown sugar, one-fourth cup salt, three teaspoonfuls mustard, three pints vinegar. Boil forty minutes. Can as MOTHER'S PICKLES.

CARROT CONSERVE.—Three pounds carrots chopped fine and cooked, four pounds sugar, one-third pound ground almonds or walnuts, juice and rind of six lemons. Boil altogether for forty minutes. Can as MOTHER'S PICKLES.

GREEN TOMATO MINCE MEAT.—One peck green tomatoes, five pounds brown sugar, two pounds raisins, one tablespoonful each salt, cloves, cinnamon, allspice, nutmeg, one cup vinegar, generous lump butter. Chop tomatoes fine and drain, add as much water as was drained away and boil until tender. Add other ingredients and boil until thick, then add vinegar and boil a little longer. This will keep the same as any mince meat and taste as well.

Seed Selection.

P. E. CLEMENT, MOORHEAD.

Any discussion concerning the need of better seed of all kinds is unnecessary before this convention. The facts are so obvious to you that they need no explanation. The problem before us today is that of placing these facts before the farmer in such a forceful manner that he must heed them. These questions have been discussed in conferences, for lo! these many years. Volumes have been written on the subject and these same volumes now lie on the shelf, covered with dust, or have been used to kindle the morning fire. The past methods have failed to reach but a very few of the most aggressive farmers, because a large majority do not have time to read this voluminous matter.

The impression that reaches the mind through the eye is much more lasting than that which reaches it through the ear, and that which reaches it through the pocketbook is most effective of all. This being the case, it seems to me that the method of procedure is clear. We must in some way show the farmer that there is money in selecting good seed, that he can make bigger wages per day at this work than at any other one operation on the farm and that at a time when the farm work is not rushing.

One of the wheat demonstrations carried on in Clay County, Minn., furnishes a good example. The demonstrator went to this man's place when he was seeding and found that the wheat he was sowing was foul of weed seeds and contained much shriveled grain. The farmer readily consented to clean enough for a six acre plot. The time required to clean a place in the granary, move the fanning mill from another building (he had not had time to use it that season) and running the wheat through twice —taking out about one-fourth—was one and one half hours for the two of us, or three hours for one man.

All through the growing season the line between the plot and the field was easily distinguished by the more vigorous growth and darker green color of the wheat on the plot. One and a half bushels per acre more was threshed from the plot than from the field, or nine bushels more from the whole plot. This nine bushels at eighty cents per bushel would bring $7.20. What does this $7.20 represent? Only three hours time. At this rate, in a ten hour day, this farmer could have earned $24.00.

But why reduce it to dollars and cents? Isn't one and one half bushels per acre sufficient evidence? No, I think not, be-

cause there is nothing to show how much time it represents. It is not so easy to see that one and one half bushels per acre may represent the difference between profit and loss in farming. It requires about thirteen bushels of wheat per acre to pay the cost of production. This one and one-half bushels more would represent a profit of $1.20 per acre. It is the matter of taking care of the little things in farming that gives a profit in it. This is where so many farmers fail.

P. E. Clement.

The potato demonstrations carried on in Clay County show even greater results in seed selection and disease control. I think we are not so much concerned with the scientific accuracy of these results as we are with the question, "Will they work out in actual farm practices?" These demonstrations were carried on with that one thing in view. Can the farmer himself put them into practice?

For these demonstrations, seed was selected for type from the bins; about one half inch of the stem-end was clipped to eliminate the diseases often found there; they were then treated in a standard solution of bichloride of mercury for one and one-half hours. This seed was then planted in the same field adjoining the bin run seed. For the three years that the demonstrations have been conducted, the average difference in yield was about fifty bushels per acre in favor of the plots. But this is not all. The potatoes were a better type, comparatively free from disease, and sold for from fifteen cents to fifty cents above the regular market price.

A few short letters from some of the co-operators will best give an idea of the value to the farmers:

One writes: "I raised at least eight hundred bushels more of potatoes from my acreage than I would have done had I planted my own poor seed."

Another writes, "I am convinced that it pays to treat seed potatoes for diseases. I have grown potatoes all my life, but it was not until two years ago that I began to give special attention to the seed I planted. At that time I selected seed of good type and quality, clipped the ends, and treated for disease. The results were satisfactory, and the seed was planted the following year. This year I have two bushels where I used to have one."

But this plot work is only a drop in the bucket of the actual results. One man bought one hundred bushels of the plot seed of the year before at fifteen cents above the market price. These he planted in the same field alongside of his own seed. From the

Ideal seed potatoes

ten acres planted with this good seed, he dug 165 bushels per acre, and sold all he cared to, at fifteen cents above the market, from the field. From the field in which he planted his own seed, he dug forty-five bushels per acre, only about half of which were marketable.

Another man writes as follows: "Growing potatoes of good quality and true to type is entirely different from just growing potatoes. This year I planted the potatoes that I got from my seed plot last year, and the results were very satisfactory. The yield was better, and the quality was much better, the potatoes being more uniform and better type.

"I sold two cars of these to Mr. Krook, at Clinton, Minn. Mr. O'Neil, of Minneapolis, happened to be in Clinton at the time, and saw the potatoes as they were unloaded. He called me up by telephone, asking if I could load him three cars of the same quality. He said: 'I will give you a good price for potatoes like those.' I had to tell him I had no more to spare.

"The potatoes that I planted from my last year's seed plot yielded twenty-five bushels more per acre than the other potatoes

did from unselected seed, in the same field, planted at the same time, given the same care, and dug at the same time."

These are only a few of the specific instances showing the results of seed selection. The fact that about 400 farmers in Clay County selected and treated seed for a seed plot the past year, shows how far-reaching the results may be.

A Member: I would like to know in what proportion he used that bichloride of mercury.

Mr. Clement: Four ounces to thirty gallons of water.

A Member: Some time ago I was reading in the National Geographic magazine, down in Peru, where all our potatoes come from originally, they recognized some twenty species in one field. They didn't plant them separately, they planted them altogether. It was suggested to send down there and get seed from the original source, as our potatoes first went to Spain and afterwards to northern Europe. Has this suggestion been followed up, and are we now getting potatoes from the original sources or do we still use those from northern Europe?

Mr. Clement: I cannot answer that; one of the college professors could probably tell us.

Prof. Mackintosh: Of course, the potato first went around that way, but at the time of the big potato rot in New York someone got the idea that we ought to go to the south and get potatoes direct. That was the beginning of our present potato work, and there are experts who are getting those potatoes all the time, so that that is being looked after pretty well.

Prof. Brodrick: Did you find bichloride of mercury more satisfactory than formalin?

Mr. Clement: Yes, sir. There is one potato disease, that of rhizotonia, which is not affected by formalin.

Mr. Rasmussen: Are you doing any hill selection?

Mr. Clement: We have made a small start on that. We are trying to give the farmer something that he can put into practice without seeing too much work ahead of him. Hill selection is good, but the average farmer will not do it. We want to give him something that he will do.

A Member: After soaking these an hour and a half, do you cut them up after that?

Mr. Clement: They are usually cut after they are taken out of the solution. There are different ways used. I am not sure but that I prefer the method of treating after the cutting rather than before. It is easier to handle them that way. I think one eye is enough to plant, but the pieces that I cut run from one to two eyes. I plant the pieces about twelve inches apart.

A Member: What has been the yield the last three or four years?

Mr. Clement: About 100 bushels per acre for Early Ohios. We have raised 363 bushels to the acre on our plots. If we average 150 we are very well satisfied.

West Concord Trial Station in 1916.

FRED COWLES, SUPT.

The past season was one of extremes. The spring was wet and cold; later it was dry and hot; but where the cultivator was kept busy things did well. While drouth is trying to vegetation in many localities, our soil will produce well when it is very dry. Our apple crop was light. Some of our top-grafts bore this season. Northern Spy was full of fruit which hung to the tree well; Delicious had one apple on; also Jonathan bore some.

Field of everbearing strawberries at West Concord Station.

The apple trees that we received from the station all did well. The two varieties of everbearing raspberry both bore a little. We like the appearance and the flavor very much. Nos. 1, 2, 3 and 4 bore this year. All are very good, but we like No. 4 the best of all. They did not winter-kill.

Our strawberry crop was good. The Progressive and Superb bore a splendid crop in the spring, also a heavy crop in the fall. As soon as they were through bearing in July we mowed them off and burned the bed over, and we were surprised to see how they bore in September and October. One should be careful in burning to have a strong wind so the fire will go over the bed very fast. Although the season was dry our spring set plants bore well. From nine rows ten rods long we picked about 500 quarts. After August 1st they were luscious berries and went quick on the market. They also set a nice lot of plants. No. 1017 showed up very good this fall, but so far it does not come up to Progressive and Superb.

As a Junebearing berry we are greatly taken up with Minn. No. 3. It is such a thrifty plant and a good bearer. We believe in time it will take the place of Sen. Dunlap.

Plums did not bear any fruit except a few thickets of wild plums.

Grapes bore a light crop, and the hot season matured them. Worden, Moore's Early are our best kinds—Concord so many years does not ripen.

The fall blooming ornamentals did not do very well on account of the dry weather. Phlox was a short season, dahlias did not do much; gladioli were good this year; we enjoyed Mrs. F. King and Baron Hulot, also America.

In Memoriam – J. M. Doudna.

On February 16th, 1917, J. M. Doudna, the veteran bee-keeper, passed away.

This name is one well known to the bee-keepers of the Northwest, as he was one of the pioneers of that industry, having been engaged in the business for more than forty years, and keeping always in close touch with the most advanced methods.

Years ago his display of wax and honey was one of the most interesting of the exhibits at the Minnesota state fair.

He was a member of the Bee-Keepers Society and of the Horticultural Society since 1892, in all twenty-five years.

Mr. Doudna was born in Zanesville, Ohio, in 1837. The first school he attended was held in his father's kitchen, and he learned to write on shingles with pieces of charcoal.

Very interesting indeed were the stories he used to tell of those days, of his hunting and trapping when a mere child, of the little log school house, of the apple trees on his father's place which were planted by "Apple Seed Johnnie," of the great beaver dams, and the quantities of wild turkeys and pigeons.

He was married at twenty-two, but his wife died during the year and he never remarried.

He enlisted at the beginning of the Civil War, and served four years as postal clerk in the Mississippi Marine Brigade.

At the close of the war he went to Alexandria, Minn., and soon after went into the bee industry. He remained there until thirteen years ago, when he came to Minneapolis, and settled south of Lake Harriet, where he kept a small apiary until compelled by ill health to give up his beloved bees.

Cider and Vinegar a By-Product of the Minnesota Orchard.

W. G. BRIERLEY, ASSISTANT PROF. OF HORTICULTURE, UNIVERSITY FARM, ST. PAUL.

This discussion will be a continuation of the subject presented at the winter meeting of last year. Our study of the cider and vinegar making possibilities of Minnesota apple varieties has gone forward another year with results which may be of interest at this time.

Apples of as many varieties as could be secured were used, some coming from University Farm, some from Excelsior and others from La Crescent. In no case was there any marked variation in the cider yield of a given variety from any of the three sources. Chemical analyses showed that the sugar content for a given variety varied somewhat, but not very widely as a general rule. Some of the variations were doubtless due to the varying stages of maturity of the apples or the unavoidable delays in transit.

Our hand operated presses have shown for the third successive year that cloth containers, or "press cloths," for the pomace, together with press boards to provide drainage, give the highest yield of cider. If the pomace is ground reasonably fine and well pressed, the "press cloth" machine will almost always nearly double the cider yield obtainable in the "barrel" or "drum" machine. No one would advocate the throwing away of a "drum" type of machine, but for anyone about to purchase a press, the press cloth machine would appear to be the most satisfactory in regard to the amount of cider extracted and the generally neater sort of work done. This type of machine can be found in the "Orchard Queen" press made by the Puffer-Hubbard Company, of Minneapolis.

No tests have been made with power machines, as these are usually too expensive for the individual grower. Power machines are usually efficient and commonly have the press cloth equipment. Such machines are used by the Excelsior Fruit Growers' Association and by Mr. William Pfaender, of New Ulm, with generally satisfactory results.

If we consider cider making a rainy day job and the apples as of no value, being culls, it will be seen that the work is not at all expensive. With the hand presses used at University Farm, with labor at twenty-five cents per hour, and with the average production per man per hour nearly ten gallons, the average cost of production of cider has been very close to two and one-half

cents per gallon. The Growers' Association at Excelsior made sweet cider from culls this fall at a cost estimated as not over three cents per gallon. Good quality sweet cider will sell above twenty cents per gallon, and a bushel of apples will yield on the average two and a half gallons or better. This would secure a

Orchard Queen cider mill—a very efficient press cloth type, made in Minneapolis by Puffer-Hubbard Co.

price of better than fifty cents a bushel for cull apples with a net return of better than forty-seven cents per bushel.

If the three-cent per gallon charge be doubled to cover probable costs in the making of vinegar from the sweet cider, it is still an inexpensive process. There should be no difficulty in securing a price of thirty-five or forty cents a gallon for good vinegar. Granting that there will be some loss in the vinegar making, this price would still insure a good profit from cull

apples. A bushel of Wealthy culls should yield at least two and one-half gallons of cider. If two gallons of vinegar are secured from this, and we have done this at University Farm, selling at thirty-five cents a gallon, it would give a gross return of seventy cents and a net return of sixty cents or better for the bushel of culls, which is a pretty good profit on a bushel of cull apples. With a good vinegar, the price secured ought to be higher, as the supply of good apple cider vinegar is not great, and profits would be increased in proportion.

The figures secured by chemical analyses at the various stages of maturity show clearly that the best time to grind for cider and vinegar is when the apples are "hard ripe," or fully matured, without being at all mellow or soft. At various other stages of maturity, as green ripe, or soft ripe from storage, there is a lessening of the sugar content of the ciders. With less sugar in the cider, it is not as good for sweet cider and there is less chance to secure a vinegar of state standard. This fact should be kept in mind when anyone wishes to make cider or vinegar.

A comparison of the determined total sugar content of Wealthy, Hibernal, Patten and Duchess, for the past three years, bears out fully the statement made a year ago that the sugars are not high in our Minnesota apples. They taste good enough, but the analyses show that for vinegar making there is not enough sugar to permit the securing of a good vinegar with careless work. The low sugar content is due perhaps in part to our shorter season, and in part also to the fact that most of our varieties are summer or fall apples rather than winter apples. The three-year average of our analyses shows that the Wealthy leads in sugar content with 8.30%, Hibernal is a close second with 8.27%, Patten is third with 7.86% and Duchess last of the four with only 7.33%. Occasionally, varieties test higher in sugars, as Charlamoff last year with 9.25% and Whitney last year with 9.08%. This year our highest sugar content has been found in Talman Sweet with 10.43%, Hibernal and Wolf River with 9.06%, Swaar with 8.91% and Anisim with 8.90%. These figures are of interest in view of the usually accepted belief that at least eight per cent of sugars are necessary to permit the development of a vinegar of four per cent acetic acid content, which is the percentage required in this state.

In actual fermentation trials this ratio of eight per cent sugars producing four per cent of acid has not been borne out. Our best vinegars of last year were made from Wealthy, testing

at pressing 7.25% sugars. This cider made a vinegar of 4.63% acetic acid on March 4th, 1916; 5.73% acid on May 25th, 1916, and 6.18% acid on September 19th, 1916. This certainly did not follow the ratio of eight to four, but gives a ratio of 7¼ to 6 1-6 approximately. From Hibernal, testing at pressing 7.85% sugars, a vinegar was secured which tested on September 19th, 1916, 4.67% acetic acid. One cask of Patten followed the ratio of eight to four, giving from a cider, testing at pressing 8.21% sugars, a vinegar of 4.12% acetic acid on March 4th, 1916. This might have become stronger in acid if it had been allowed to stand longer, as not all of the alcohol had been converted into acetic acid. Other varieties did not come up to our expectations. Charlamoff, with 9.25% sugars, made a vinegar of only 3.18% acid on September 19th, 1916. Whitney, with 9.08% sugars, did not at any time make more than 2.26% acetic acid. Duchess, with 7.86% of sugars did not at any time make as high as two per cent of acid. Longfield, always low in sugars, at no time produced a desirable vinegar, not only testing low in acid content, but having a decidedly repugnant flavor.

From these trials it would appear that it will not pay to try to utilize Whitney, Duchess, or Longfield in vinegar manufacture. The Whitney makes a good sweet cider and should sell readily as such, but the Duchess and Longfield will not appeal to anyone as sweet cider from the fact that they do not live up to the name. Wealthy, Hibernal and Patten should give good sweet ciders, or good vinegars when properly fermented. Good vinegars can be secured from a mixture of these varieties as well as by keeping them separate. The Wealthy makes a sweet cider that ranks with the best, and there seems to be no question in regard to the vinegar making qualities of this variety. Windfalls and culls should be disposed of easily in either of these ways.

Mention should be made again of the need for careful work in vinegar fermentation. Wash dirty apples, keep all machinery and barrels clean, do not put more than thirty-five gallons in a fifty-gallon cask, add compressed yeast at the rate of one cake to five gallons of cider, and keep the cider in warm quarters, with the bung covered with cheesecloth or plugged with cotton. Draw off once or twice in the season to get a clear liquid without sediment if a filter press is too expensive. If the vinegar does not "make" in due time, add some good vinegar at the rate of one quart to thirty or thirty-five gallons. Such work should produce a vinegar above the state standard of four per cent acetic acid.

At University Farm this year we have over a thousand gallons of vinegar in the process of fermentation, the intention being to check and enlarge upon our previous work and to report later.

Native Plums, Their Hybrids and Their Improvement.

DEWAIN COOK, JEFFERS, MINN.

Native Plums.

Of these little need be said at this time. Growing wild in our woods and thickets, and cultivated in our gardens, most of us know about all there is to know about this, the most popular of native fruits.

Owing mostly to numerous insects and diseases that prey upon the trees and fruit they cannot be depended upon as a class to bear crops of fruit with regularity. This fruit is excellent to grow for home use, but owing to its perishable nature, even when placed in cold storage, it is not a fruit to be depended upon for market purposes. Whatever disappointments we may have experienced in growing this fine native fruit have been mostly because we have been led to expect altogether too much from it. It is a fruit to make plum jell from, also for eating out of hand, and is sometimes used for canning purposes, plum butter, etc. The improvement of the native plum through native plum seedlings is a slow process at best. To the best of my knowledge there has been no improvement in the Americana plum through cultivation and seedling selection up to the present time. This brings us to the subject of hybrid plums. Judging from experience in growing hybrid and other plums on our farm here in southern Minnesota, I size the situation up something like this —the short road to a better plum than any we now have of the native varieties, a plum that will be suitable for commercial purposes, must come as a hybrid of our native plum with one of foreign origin. If this method fails us, and we are left to depend upon the slow process of seedling selection of native varieties, then very little improvement can be expected during the lifetime of any one person—but we have hopes, and these hopes lie in the hybrid plum class.

We hope to get firmness of fruit through the hybrids of native and European plums. Two varieties fruited on my farm the past season indicate it.

We hope to get added size of fruit, better quality and greater productiveness through the native and Japanese hybrids. These hopes are based upon our experience with the Emerald, the Stella and the Waneta, and others, all of which are Japanese hybrid varieties.

There is another class of hybrid plums I consider worthy of notice and that is the sand cherry hybrids, crosses of the sand cherry and native plum, also of the sand cherry and Japanese plums. These hybrids have added one week to the season we can have ripe plums, by giving us a variety that is one week earlier than any variety we heretofore had.

The fruit of these sand cherry hybrids as a class, especially those crossed with the Japanese plums, is to my notion extra fine for eating out of hand, having a peculiar, pleasant half sand cherry flavor. The fruit of all of these sand cherry hybrids are ideal breeding places for the plum curculio. Sometimes every one of the sand cherry plums on the tree will have a worm in it. Another thing about the fruit of this class of plums is its susceptibility to the disease known as the brown rot, which often takes the whole crop, leaving only mummified plums on the trees. The plum curculio destroys the plums, the brown rot destroys both the fruit and the worm, thus holding the curculio in check. Then perhaps we may have a favorable year. Along comes a season that is dry and hot all through, but little rain, no dews, abundance of hot sunshine—the brown rot cannot exist under these conditions—then the sand cherry hybrids are at their best. The curculio having in previous years been kept in check by the brown rot, we get a fine crop of this elegant fruit that is a delight to the grower.

There will be less disapointment in growing this class of fruit if only an occasional crop is expected. I have now given you the best I know regarding the way to get better plums. I may be wrong in my conclusions, and I want up-to-date opinion on this subject, therefore will read to you a letter from A. B. Dennis, the Iowa plum expert. The letter speaks for itself, and here it is:

Cedar Rapids, Iowa, November 12, 1916.

A. W. LATHAM,

Minneapolis, Minn.

Dear Sir: I write you to get a list of the best pure native plums in your state or Wisconsin.

It seems our plum breeders have gone crazy in using our natives to get Japan hybrids. I have tested over 40 varieties of Japanese and Chinese plums, and many of the so-called cross bred seedlings, and find very few of them equal to our first natives, for they always manifest some weak points somewhere. So I think it is time to call a halt, and give our hardy natives a

chance in development by crossing our six native species, and then planting these native hybrids alongside of the Japanese hybrids, and I feel sure the native crosses will soon demonstrate their superiority over all those with foreign blood in them.

We must take the natives for our trying climate, the same as we had to do in the American grape industry. So far as I known no vinifera grape hybrid is a pronounced success in the prairie states.

And when the pomologists will use common sense they will find out that some day our plum industry will have sprung from the six native species.

These foreign blooded hybrids are all right for California—but so far as I have watched them here, very few of them are much more than novelties.

I am in my seventy-fourth year, and it is hardly possible I shall see the end of the craze for hybrids that sooner or later must manifest weak points. I have tested more Japanese and Chinese plums in Iowa than most of plum culturists, and I have not found anything to excel, or even to equal, our improved natives, much less to exclusively use them for a permanent foundation, or for a successful foundation for our prairie horticulture in plum culture.

If I were a young man I should heed the two or three hundred years wasted in trying to build the American grape industry upon the vinifera, or European grapes, and stick to and rely principally upon the native plum, that even without any scientific breeding even now rivals the Oriental and Domestic species that have had human culture thousands of years, while the native is scarcely rescued from the woods and the plum thickets of our prairie states.

Thanking you for any information you can give me on plums.

Yours truly,
A. B. DENNIS.

Mr. Gardner: Don't you think that these Japanese hybrids you have been speaking of, if they were planted on dry ground and planted a good distance apart where they would have good air drainage all seasons, that a great many of them would probably be successful?

Mr. Cook: Why, I think a great many of them are successes. That is why I recommended planting some of them. I couldn't tell that in the paper because I had too short a time.

Mr. Gardner: Don't you think that is one difficulty, we don't plant them on the right soil?

Mr. Cook: I don't know. I think any soil that is dry enough is all right for the plum. They will stand as low as the

apple will, but in good soil it don't make any difference whether it is high or low, whether on creek bottom or on the hills, it will be all right for plums, and I think the hybrids are the same way.

Mr. Gardner: I think they require a dry soil, and in our country you don't want to plant them unless you can give them a good dry place, give them plenty of room and give them good sunning.

Mr. Cook: Yes.

Mr. Gardner: I would like to ask Professor Hansen whether I am right or wrong on that idea?

Prof. Hansen: You are right on that.

Annual Report, 1916, Vice-President, Eighth Congressional District.

J. KIMBALL, DULUTH.

Horticulture in the Eighth Cong. District is largely in the experimental stage. A few persons in different localities have been anxiously testing the soil and climate in order to learn what varieties could best be grown, and after a few years trial have met with varied success. These persons have "blazed the way" for others to follow with doubtless better success.

The reports received from different parts of the district for the past year show a light crop of apples of different varieties and especially of the crabs. Plums were below medium. The Compass cherry produced a medium crop. The few grapes tried made a good growth and a little fruit in a few localities. Blackberries that had winter protection did fairly well. Raspberries bore well, and the canes are reported to be in good condition. Strawberries bore a large crop, and the plants are looking well. Currants and gooseberries have both done well and are in fine condition.

In some localities new stock has been planted with questionable results.

Blight in a few cases is reported, and cutting away the diseased wood has been the remedy applied.

Spraying is not generally practiced. No wormy fruit is found as yet.

The extremely long and cold winter did considerable damage to young apple trees. The Hibernal is mentioned by two persons in their reports.

Conditions for the coming winter are quite favorable with a medium amount of water in the soil.

The fruits doing best in this locality are strawberries, raspberries, currants, gooseberries, plums, Compass cherry, crab apples, Duchess, Okabena and Hibernal apples.

Perennial flowers reported are peonies, foxglove, larkspur, gladiolus.

Ornamental shrubs—barberry, high bush cranberry, dogwood, elder and sumac.

Windbreaks by the Mile.

T. A. HOVERSTAD, AGRI. COMM'R. "SOO" RY. CO., MINNEAPOLIS.

Shortly after I was appointed agricultural commissioner on the "Soo" Road I was asked to take charge of the work of planting trees along the right of way to take the place of the snow fences. Our company has about 4,000 miles of road in the Northwest, where the snowfall is apt to be large. It is a great big problem to know how to protect the cuts so as to keep the trains moving regularly. The patrons of the road are not satisfied unless they have regular train service, and it is no simple problem. The price of material for snow fences is almost prohibitive. This year alone we paid out about $16,000, and after a snow fence is built it is only a little while before it is destroyed. Then we have the expense of taking it down and putting it up again. If we put it outside of the right of way we have to pay a big rental for the use of land

A thousand dollars or ten thousand dollars does not go very far, and when we have a winter like last year we have to throw away all thoughts of expense. When the train is blocked we have to open up the track, no matter what it costs. So this matter of tree planting is not anything we care particularly to do, but we do it because we have to do it.

A great deal of our line is in the Dakotas, and we are also in Montana, and where we are planting trees is where it is the more difficult for us to make them grow. We plant mainly along the cuts, and those are more often gravelly, and it is on the highest points and the dryest points. It is close to the edge of the cut, where it is the very dryest place we can find.

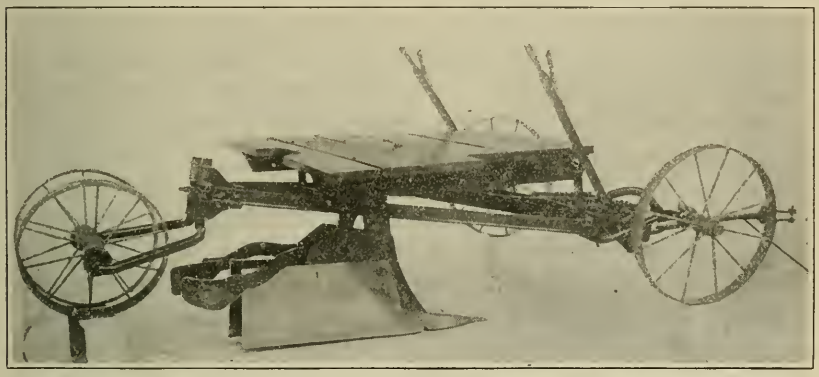
We first start out with the preparation of the land. We found it to be a very hard, dry soil, and last year we plowed and subsoiled. This year we abandoned subsoiling. We plow the land twice and disk it thoroughly for two years. The reason we abandoned subsoiling was this. We didn't feel as though it was necessary to subsoil except just in the row when the trees are being planted, and we have made a machine that subsoils and plants at the same time.

We are doing our work in various ways. Sometimes we hire men and do the work by contract. We have to board the men and teams and hire tents, etc. We move them on the track, of course. We have also the farmers along the road to do the work, and that is very much cheaper. They do the work just

as well, but we can not always depend upon them to do it at the exact time we want it done.

The third way we are working is in devising a machine that will prepare the land and also cultivate the soil. I think in a year or two we will have such a machine. It is simply a dream yet, but I hope in the future to tell you something about the results of our efforts.

We first planted the trees by hand. We planted 35,000 trees in 1915. Each man plants about a hundred a day. The best record we made was 2,000 trees a day by twelve men. We found hand planting too expensive, and anticipating difficulties later we began to hunt for a tree planting machine. I did not find anything



A machine for planting trees for windbreaks along the "Soo" line in the Northwest, under the superintendence of Mr. Hoverstad.

in the length and breadth of the country. We designed one of our own, and last spring we did all our planting with it..

We have made only one machine, and that planted between 75,000 and 100,000 trees. Most of them are alive today, so the first trial is a success. Of course, the first machine was not in all respects satisfactory—there are some defects we shall correct —but it was very much better than we had anticipated. The machine is not patented and will not be patented. We think we can plant 10,000 trees a day with it, and when it is perfected we may be able to plant 20,000 to 25,000 trees a day. I am not sure whether such a machine is a practical thing for planting trees except under our conditions. What we are interested in is not the trees. What we want is to stop the snow before it gets to the track. We do not care very much about a tall stem to the trees, because that doesn't hold the snow any more than a fork handle. We want a tree with the greatest amount of branches that we can possibly get to grow close to the ground.

We have prepared the land this year, along 325 miles on our lines, and we have on hand about 400,000 trees we are planning to plant out next spring. After the trees are planted we shall spend about three years in cultivating them. It is a very different proposition to do this work along the right of way than it is in the open field, and this work is yet in the experiment stage. We do not yet know how to prepare the land most economically, we don't know much about planting it economically, we don't know much about cultivating the land afterwards to do the most work at the least expense—it is expensive the best we can do.

A year ago we used a one-horse cultivator, and then we hoed the trees. That is the most perfect way, but it is too expensive. This year we abandoned the hoe altogether, we felt that it wasn't absolutely necessary. If there were weeds growing along the rows, while it would look bad we didn't think it was enough injury to the trees to go to the expense of hoeing them.

We used a two-horse cultivator that would cultivate about six feet wide. We used the shovel cultivator and disk harrow. When we have 100 miles or more to cultivate, by the time that we go through and get back again the weeds have made a good start. The machinery for cultivation was not altogether satisfactory. I think we will have to use a rotary tiller that runs by gasoline.

We planted at first four rows of trees on the north side of the track and three rows on the south side, but we found in examining the trees that had been planted along the right of way that we hadn't planted enough and so this year we planted eight rows on the north side and four rows on the south side, and I think next year we will plant eight rows on each side. It will take about 20,000 trees to the mile, but I think it is much cheaper to plant a large number of trees as long as we feel assured that by their use we can stop the snow.

I went over the Northern Pacific Railroad a year ago. They have done a great deal of work, and the Great Northern Railroad has done very much more. What I saw at Larimore, N. Dak., thoroughly convinced me of the effectiveness of tree planting for snow protection along the right of way.

Last winter was an exceptional winter, but in examining the planting which was done eleven years ago we found that the snow didn't get through the eight rows.

I believe we can say absolutely that the trees are away ahead of snow fences, that there is no snow fence we can use that will

be so effective as the trees when properly taken care of. We are planting willows on the outside. We put in the cottonwood, although it doesn't stop the snow very much, but it grows tall and rapidly. The green ash doesn't stop the snow very much, but it is a valuable tree, and it serves our purpose to a certain extent. We like to have a variety of trees, as we may have insect pests which may attack one variety and not another. The box elder is a very desirable tree because it is a shade enduring tree, and its branches grow right down to the ground, and it is able to live in the shade of the other trees. Then the rest of the trees are willows. The willow is head and shoulders above everything else, and we usually put in four rows of willows near the track. They are used extensively along the Great Northern tracks.

One of the things we have to do, and one of the reasons we have so many rows of willows, is that we will periodically cut the trees down. In that way they will branch out so we will have a dense branch growth down near the ground. In the course of a few years we will probably cut the second row and afterwards take the next row, and so on.

We now have 125 feet right of way on the north side and seventy-five on the south side. We shall probably buy up to 125 feet on each side of the track.

We have our own nursery of eighty acres near Drake, North Dakota. We selected this particular location because it was in that locality where most of our trees will be planted. We selected as sandy a tract as we could find. It would be more satisfactory to me if we could have had some nice river bottom land, but that would not be practicable, as these trees must be planted on the grades where it is gravelly and dry. I raised about 80,000 trees last year and about 200,000 this year, and we have been buying a lot of seed and cuttings so that we expect to be able to produce our own trees from now on at the very lowest cost

I think I am up against a difficult proposition in tree planting as I have such dry land in which to plant them, but in case I succeed under those conditions there is no reason why the farmers should not succeed fully as well with their tree planting at their homes where the conditions are favorable. One of the things we hope to do is to encourage farmers to plant large groves around their homes, and in that way they will help us to delay the snow before it comes to the track.

There is quite a little discussion in North Dakota about planting long rows of trees along the right of way. President Worst, of the N. D. Agricultural College, has been advocating that

for a number of years. If it is done it will help us, but it will also be a great benefit to the farmers as it will help to lessen the destructive effect of the hot, dry summer winds.

A Member: How many of your trees died last year?

Mr. Hoverstad: We haven't made any count, but I believe we saved about 90 per cent, and we saved just as large a per cent of those planted by machine as of those planted by hand.

Mr. Black: It came into my mind that it would be a great place for a fire caused by trains going by with weeds grown among the trees. What precautionary measures will you adopt to save the trees later on?

Mr. Hoverstad: We haven't taken any particular precaution. During the time we are cultivating the trees, which will be three years, there isn't very much of any danger of fire. After those three years I don't know what we shall do. I anticipate that the leaves that drop will keep the weeds down along the shade of the trees because we are planting them very close together. I am inclined to think the weeds wouldn't grow very much, and I don't think there is really very much danger of fire. We are planning to put in some evergreens, white spruce especially.

Mr. Black: Have you tried the red cedar?

Mr. Hoverstad: We have planted red cedar, and we have the ponderosa pine in our nursery for trial, but we expect to put them out among the other trees and give them better protection. I don't think it would be a wise plan to get them out on the right of way at the same time we are planting the other trees.

Mr. Black: I spoke of the red cedar because it does very well on sandy land.

Mr. Hoverstad: Yes, it does very well in the Dakotas.

Mr. Cook: I wanted to say something about the evergreen when it was on the program. The Norway spruce, I believe was recommended to some extent, and I believe that Mr. Moyer claimed when they got old they didn't do so well. I live in a prairie country, and I will say this for the Norway spruce, that on our moist land, in a sheltered location, they do very well. My largest Norway spruce got to be fifty feet high and was finally struck by lightning. I have Norway spruce that are twenty-five feet high. However, if you plant Norway spruce on the open prairie unprotected they will prove a complete failure. They have not the hardiness; they can't stand the sandy soil, but they can stand the wind and frost.

I believe the black spruce was brought up. I sent for some white spruce one year, and they came black spruce. They got full of little cones and were a nuisance. I kept picking them off. Along came a dry season, and they all died. I used to think they were pretty good. The society did not recommend them, and I thought the society was wrong, but now I think they were right about it, they will not stand the dry weather.

I think our old friend, Mr. Smith, mentioned white pine. And I put out a lot of white pine and they grew all right, but they didn't spread out and made a failure. I think on the prairie they are absolutely worthless.

Mr. Smith: What I spoke about was the white spruce. That fails when it gets to be twenty-five or thirty years old. The Norway pine is just as hardy as the white spruce.

Mr. Underwood: It all resolves itself into one fact, that it depends on moisture. They die because they do not get enough moisture; they want a drink. The black spruce grows out in the swamp, it doesn't grow naturally on high ground. It is lack of moisture.

Annual Report, 1916, Vice-President, Ninth Congressional District.

A. L. HANSON, (RED RIVER VALLEY) ADA.

Sent twenty-eight requests for report to members in the District, and received seventeen replies. These indicated the following conditions in the district.

Apples almost a failure for the year.

Plums a very light crop—a failure in parts of the district.

Cherries only a few report any—the Compass only kind reported as yielding a fair crop.

Grapes—none.

Blackberries—none.

Raspberries—reported an abundant crop by some, others not any.

Strawberries reported a good crop. Sen. Dunlap, Progressive everbearing, Seedling No. 3, being the varieties named.

Other fruits reported were currants, gooseberries and wild cherries.

Blight is reported as doing considerable damage and nothing being done to combat it.

Spraying reported only by three and by them as being only an experiment.

Some damage is reported from the cold of last winter, especially the late freezing in the spring.

Fruits are reported as going into winter in good condition, with plenty of moisture.

The varieties reported as doing best are: apples, Duchess, Wealthy, Whitney and University; plums, DeSoto, Forest Garden; cherry, Compass; raspberries, Sunbeam, King, Minnetonka.

Hardy perennial flowers: peonies, phlox and iris.

Hardy ornamental shrubs: lilac, hydrangea and snowball.

An abundance of fruit for the Ninth District is only dependent on proper application and care.

Fruits for Minnesota Planting.

List adopted by the Minnesota State Horticultural Society at the last annual meeting. *For the Guidance of Planters.*

APPLES.

Of the first degree of hardiness: Oldenburg (Duchess), Hibernal, Patten's Greening, Okabena.

Of the second degree of hardiness: Wealthy, Malinda, Anisim, Iowa Beauty, Lowland Raspberry, Jewell's Winter, Milwaukee.

Valuable in some locations: Wolf River, Yellow Transparent, Longfield, Northwestern Greening, Tetofsky, Peerless, Salome.

Most profitable varieties for commercial planting in Minnesota: Wealthy, Duchess, Okabena, Anisim.

Recommended for top-working on hardy stocks: Wealthy, Malinda, Northwestern Greening, Stayman's Winesap, Grimes Golden, Milwaukee, McIntosh, Salome.

Varieties for trial: Eastman, Evelyn, Windsor Chief, Gilbert, Superb.

CRABS AND HYBRIDS.

For general cultivation: Florence, Whitney, Early Strawberry, Sweet Russet, Transcendent.

Varieties for trial: Faribault, Dartt, Success.

PLUMS AND HYBRID PLUMS.

For general cultivation: De Soto, Forest Garden, Wolf (freestone), Wyant, Stoddard, Terry, Surprise.

Most promising for trial: Compass Cherry, Hanska, Opata, Sapa, Stella, Waneta, Omaha.

GRAPES.

First degree of hardiness: Beta, Janesville, Hungarian.

Second degree of hardiness: Moore's Early, Campbell's Early, Brighton, Delaware, Worden, Concord, Moore's Diamond, Wyoming Red.

RASPBERRIES.

Red varieties: King, Sunbeam, Miller, Loudon, Minnetonka Ironclad.

Black and purple varieties: Palmer, Gregg, Older, Columbian, Cumberland.

BLACKBERRIES.

Ancient Briton, Snyder, Eldorado.

CURRANTS.

White Grape, Victoria, Long Bunch Holland, Pomona, Red Cross, Perfection, London Market.

GOOSEBERRIES.

Houghton, Downing, Champion, Pearl, Carrie.

STRAWBERRIES.

Perfect varieties: Bederwood, Enhance, Lovett, Splendid, Glen-Mary, Clyde, Senator Dunlap, Minn. No. 3.

Imperfect varieties: Crescent, Warfield, Haverland, Marie.

Everbearing varieties: Progressive, Superb.

ORNAMENTAL FRUITING SHRUBS.

Valuable for trial: Dwarf Juneberry, Sand Cherry, Buffalo Berry, High Bush Cranberry.

NUT FRUITS.

Shellbark Hickory, Black Walnut, Butternut.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So. Minneapolis.

(Concluded from July Number.)

The varieties of the Iris that can be easily grown in this latitude are those described on the chart here given. First, there are the bearded Irises, comprised of the Dwarf, Intermediate and Tall Germanicas. The Dwarf Irises flower from late in April until late in May. They grow from six inches to a foot in height and are adaptable for edgings and rock gardens. The Intermediate Irises flower next during the month of May and grow from one foot to twenty inches in height. They are very beautiful, and just as handsome as some of the beautiful tall Germanicas. The next in flower are the tall Germanicas, which grow from eighteen inches to four feet in height, and which in this locality flower from May 20th to July 5th.

The word "Germanica" is derived from the word germane, meaning root, and the name "German Iris" is incorrect, as practically none of this variety are natives of Germany.

The Germanicas form a large part of the Iris family. As shown on the chart, there are over 400 varieties which are of practically every color from white to black, through purples, lavenders, yellows, pinks, reds and copper colors, most of which are very beautiful.

The next branch of the Iris family, and which are the next to flower, are the Beardless Irises. The Sibericas are the most delicate and elegant of all the small flowering Irises and are of shades of blue, violet, purple and white, growing from two to four feet in height. There are about fifteen varieties of this Iris. They flower during June. Then during June and July certain other varieties of Irises, which we call Beardless Border Irises, come out in flower, growing from one to four feet high, which in foliage and shape of flower are somewhat like the common water Irises, but which should be planted above the water line, and which are beautiful in colors and suitable for borders and by the waterside.

During this same period the Water Irises come in flower, the Psuedo-acorus, common yellow Iris, of Europe and the Versicolor, or common purple, Iris of America. Certain other colors have been developed from these varieties, making about ten in all. These few Water Irises and the Japanese Irises are the only ones that will grow in water, so that, contrary to the general belief, of all of the great family of Irises only about 15% can grow in water. All of the rest require dry soil the same as other hardy perennials.

The Japanese Irises commence to flower here the latter part of June and continue through July and a part of August. They are the most gorgeous in colorings, growing from two feet to four feet high, with flowers of three to six petals, some measuring ten to twelve inches in width. The flowers are marvelously beautiful. They can be grown in water or in dry soil. They flower at their best in this vicinity between July 1st and July 15th. In addition to those which I have mentioned there are certain bulbous Irises which can be purchased in the fall and planted then the same as

Tulips. These are the Dutch, Spanish and English Irises. They have practically no foliage and can therefore be planted between other perennials to cause continued blooms, the different varieties flowering during June and July. These Irises have a wax-like appearance of various beautiful colors and make magnificent cut flowers. They will last for several years, but every third or fourth year should be replanted and the dead parts removed, for, unlike the Gladioli, the new bulbs form at the bottom of the bulb instead of at the top, and the old growth must be removed from the top to enable new growth.

With the possession of a few of each of these different varieties of Iris you will have beautiful flowers from April until August, a much longer period of bloom than with any other hardy perennial. Further, although they are usually transplanted in the spring and fall, they can be transplanted practically at any time, and such transplanting will not hinder their blooming. I have received shipments from Europe the first of June after having been on the way for six weeks, and had them flower before the end of June. Irises require no watering whatever. They will stand the severest drought. Last year ours went through the entire dry, hot summer without any water whatsoever. They are adaptable to any kind of soil, to any location, for beds, borders, driveways or water gardens, and in addition, the delicacy, fragrance and magnificence of the large varieties especially give them a most prominent and, in my opinion, the first place amongst outdoor flowers.—J. S. Crooks.

SECRETARY'S CORNER

Our Back Cover Page.—The Extension Division of University Farm is making use of the back-cover page of our monthly to stimulate the production and conservation of such foods as are grown by the horticulturist. Prof. R. S. Mackintosh, of that Division, has charge of this page, as he has had for two months previously, and will probably continue to have during the year. We commend his suggestions to your careful consideration. The urgency to improve the food situation of the world is undoubtedly greater than it is generally believed to be by the people of this country, who have never known what it was to want for enough to eat.

Horticultural Periodicals for Distribution.—In the last number of our monthly attention was called to the fact that a considerable number of horticultural periodicals of various kinds are coming into this office regularly, and an opportunity is offered to our members to secure them without expense by calling at the office. In response to this there have been some calls for them, but not enough to use them up as fast as they come in. Some of these periodicals are devoted entirely to fruit-growing, others to flowers, some to vegetables, and some of a general character. Some have to do especially with forestry. This material is available for any of our members without any expense to them.

ROLLA STUBBS' WEALTHY SEEDLING.—"Mr. Peter M. Gideon died October 27, 1899. He left several thousand Wealthy seedling apple trees one year old; the State Horticultural Society got them. I received two trees of them as a premium—you sent them—one lived and this is the tree. I consider my wife and I are pretty good judges of good fruit, and we think this equal to any we ever ate. They have the *real apple flavor* that is lacking in so many varieties. They taste like grafted fruit, not like a seedling—just taste enough to be good; they were *crisp and firm*. The following points are in favor of the tree and its fruit. Tree has never *blighted* or killed back any. The fruit hangs on till late in October and has to be pinched off—a good keeper. They are a pale red apple—not bright like the Wealthy. The tree is a very prolific bearer."—Quotation from a letter from Rolla Stubbs, Bederwood, Lake Minnetonka.

IMPROVING THE PLUM.—In this number of our monthly is to be found an article by Mr. Dewain Cook dealing with the plum situation in this state. Mr. Cook is in the first rank of those who have interested themselves intelligently in the growing and development of plums in Minnesota. You will note in this article, on page 322, that he anticipates an improvement in the character of plums adapted to Minnesota by crosses between our native plums and those of foreign origin. Mr. Cook, in connection with his article, publishes a letter from A. B. Dennis, of Cedar Rapids, Ia., one of the most noted plum specialists in this country. Mr. Dennis takes a very different view of this subject, expressing the opinion that it is not by hybrids that we are to secure improved hardy varieties, but by the crossing of our several native species. This is an important subject, and these two views represent the two opposite standpoints as to the future of plum growing in the Northwest.

HOW I MADE APPLES PAY.—Six years ago an orchard came into my hands along with a good spraying outfit. Five hundred apple trees were bearing well, but middlemen got the fruit, or had been getting it, at a very small price and the spraying outfit had not as yet been used.

I was a poor man and needed a fair price for my produce. But the produce must be made to equal the prices wanted. To this end the spray was applied thoroughly, and the results the first year were very satisfactory. My entire crop of 700 bushels was sold direct to consumer either by peddling or shipment. The next year I found the apples to be almost absolutely free from worms. So to get more and better customers and a little better prices the buyers were offered two cents a piece for every worm found in a bushel. Well, the idea worked splendidly and many people learned to know the value of good, clean, worm-free fruit. Surely the way to make an orchard pay big is first, of course, to make it produce good fruit and second, to place this product before the people that appreciate it.—H. P. Anderson, "Wis. Horticulture."

STRAWBERRIES NOS. 3 AND 1017.—I got three plants of Nos. 1017 two years ago. I got 280 plants from those three plants, which I transplanted last spring. I did not keep flowers picked. The first crop was fine, nice, big berries. The second crop was burned by the heat, but kept on growing. The third blooming was late with fine berries, but frost killed them. There was some blight. All plants set out runners, so I have thousands of plants.

I counted up to fifty berries on one plant, but they were small. My experience with them is to have them in hills, keep runners off, fertilize good and you will have all kinds of berries the same year.

I got three plants of No. 3 June-bearing. From these three plants I got 584 plants, which I set out last spring, three foot one way and a foot a part in row. Last fall the whole bed was covered with plants so thick you could not see the ground and besides I got a full crop of berries, the biggest strawberries I ever saw. Not a plant missed to bear fruit, not a sign of rust or blight on them. My soil is a heavy clay loam.—Frank W. Johnson, Braham.

Appropriation for the Horticultural Society.—The late State Legislature made an appropriation of $6,500 per annum for this society for the two years beginning August 1, 1917. As heretofore, $3,000 of this appropriation is to be used for the needs of the society, and $3,500 to pay for the printing of its magazine and reports. This appropriation is the same in amount as that made two years ago, which at that time was sufficient for the needs of the society. The cost of printing, however, has advanced materially, and especially in the price of paper, so that by August 1 of this year there will be a considerable deficiency in the printing account, something over $1,000. As the cost of printing is not likely to decline at present, the expense of printing our reports will continue to increase the deficiency. Just how this will be met has not yet been decided, but the Executive Board of the society has the subject under consideration. Meantime the work of the society will not be in any way crippled, but will go on the same way as usual during the next biennial period.

Program, 1917 Annual Meeting.—The year rolls around, already are we nearer to the 1917 annual meeting than to that of 1916. In a general way, the program for the coming meeting has been laid out and some material secured. As a member of this society interested in what takes place at the meeting if you can not attend, at least in what is published in our monthly—and you know that all of the papers and discussions appearing at the annual meeting are published in the monthly at some time during the year—would you not like to have something to say about the program of the meeting? Are there not some subjects that you would like to have presented at that time? Perhaps you have in mind some one whom you consider especially fitted to present a subject that you would like to have considered. It may be that there is some subject pertaining to some branch of horticulture that you have had under consideration and would like to present yourself on that occasion. The secretary is very open-minded and desirous of doing the things that please the society as far as possible, and would be especially glad to receive suggestions from the membership. It is not, of course, always practicable to make use of all the suggestions presented, though they would never be thrown aside carelessly but given full consideration. If there is no subject you care to discuss, perhaps there are questions that you would like presented at the meeting for reply. The secretary would be glad to receive such questions also.

THE PROGRESSIVE EVERBEARING STRAWBERRY AT OSAGE, IA., AND CHAS. F. GARDNER'S PROGRESSIVE GRANDSON.

(See page 351.)

While it is not the intention to publish anything in this magazine that is misleadng or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 SEPTEMBER, 1917 No. 9

Orcharding in Minnesota,

(REPORT NO. 2.)

PROF. RICHARD WELLINGTON, UNIVERSITY FARM, ST. PAUL.

At the last winter meeting of this society a report was made on orchard sites and protective agencies, as windbreaks and bodies of water. In order to make that report as specific as possible, the state was divided into six sections, namely, the southeast, central-east, northeast, northwest, central-west and southwest. Arbitrary lines were drawn between the sections and the included counties named. For the treatment of the above subject, this division was very suitable, owing to the wide variation in the topography and climate of the state.

In the consideration of the management or treatment of orchards, which will be taken up at this meeting, the same division of the state is adhered to, but it is not as applicable to this report as to the former, owing to the uniform methods practiced throughout the state.

The treatment and management of orchards considers whether an orchard is in sod or under cultivation, intercropped or cover cropped, pastured and manured or fertilized. If the orchard is in sod, questions arise as to what grasses are grown, what is done with the grass and, finally, what effect does the grass have on the health, vigor, growth and productiveness of the tree. In like manner questions arise as to the value of cultivation, inter crops, cover crops, pasturing and manuring.

Before taking up the details of this report, I wish to impress upon you the source and reliability of the facts that are to be given. All statements are based on answers to questions enumerated on orchard survey blanks sent out to those orchardists whose names and addresses could be obtained. Most of the questions were simple and could be readily answered, but others were

very complicated, as for example, the respective value of cultivation versus sod, beneficial effects derived from the use of manures and injurious effects produced by animals. Such questions can only be answered accurately by carefully controlled experiments covering a period of many years. If, however, one person could have visited all of the orchardists and orchards and many more in the same sections, his judgment of the respective merits of the different treatments should be of greater value than the summation of numerous opinions. This method was, of course, impossible without funds, and therefore the data is simply given as received. In consequence of their having been obtained from 154 reports, they undoubtedly furnish a reliable index to the methods practiced in Minnesota orchards.

From a total of thirty-seven replies in the southeastern section in regard to the use of tillage and sod, thirty-two orchardists reported that they had practiced cultivation, but only seven of these had not seeded down their orchards. In other words, there were only seven truly tillage orchards, five truly sod and twenty-five both tillage and sod. It can be stated that as a general rule the orchards are cultivated until they come into bearing and then they are seeded down to grass. Twenty-five of the orchardists reported the using of small fruits and vegetables as an intercrop, and only one of them noted any injury to his trees. The injury noted was caused by raspberries and blackberries grown for a period of eight years. Of the small fruits, strawberries and raspberries were the most commonly used, but gooseberries, currants, blackberries and even grapes were mentioned.

Most of growers agreed that the growth and vigor of their trees were increased by cultivation, but a few were skeptical as to its beneficial influence on health and productiveness. Some of the growers thought that the rank growth produced by cultivation was conducive to blight, while others reported that no blight injury had been noted in their cultivated orchards. Another point of interest is that no winter injury was caused by tillage.

Cover crops, that is, crops grown between the trees with the object of ultimately plowing them under in order to enrich the soil, to ripen the wood in the fall, to prevent soil from washing, and to protect the roots from winter injury, are little used. At least only one grower stated that he used such a crop, and his results were satisfactory.

For seeding down the orchards red clover was the most popular legume, as it was used nineteen times, white sweet clover was used three times and alsike twice. Timothy was used nine times, blue grass six times and red top once. Junegrass appeared late in nine additional orchards, and so it was the most prevalent grass. Timothy and quack grasses also gained entrance into one orchard each. Of the common mixtures, red clover and timothy took the lead.

Fifteen, or one-half of the sod orchards, were used as pastures for calves, cows, hogs, sheep and horses. Injury was noted in two cases from sheep, in one case by calves chewing off branches and in one case by "hungry hogs." Probably minor injuries were caused by the packing of the soil by the heavy animals, as cattle and horses, but if they occurred they were too small to be noted. In four cases the grass was removed and in four cases it was left for a mulch.

Twenty-nine of the thirty-seven orchards were manured or mulched. The amount of manure applied varied from a light dressing to a dressing six inches in thickness. Thus it is evident that sod, with a dressing of manure, is the most common method of managing orchards in the southeastern part of the state, that is, after they come into bearing.

The central-east section of the state, which includes the well known Minnetonka Lake fruit district, led all the other districts by a margin of eighteen reports. Of the fifty-five growers, forty have cultivated their orchards at one time or another, although only five have practiced tillage alone. Of these five, probably two or three will soon put their orchards into sod, and probably at least one will continue tillage, as his orchard has already been cultivated forty years. Forty-eight growers have used sod in their orchards and fourteen of them do not admit of having ever cultivated their orchards. Probably some of them have, however, as some of them state that cultivation increases vigor, growth, etc. As in the southeastern section, cover crops are little used. Five growers stated that they had planted cover crops, but sufficient data were not given to form an estimate of their value. One grower, however, reported that he used millet to reduce the growth of his trees, and another that he obtained no benefits, as his soil was sufficiently fertile.

Intercrops are very popular, as twenty-seven, or nearly one-half of the growers, have grown small fruits, vegetables, or both, in their orchards. As in the previous section, strawberries

and raspberries were the most commonly used of the small fruits. Injury to trees by raspberries and currants was reported by one orchardist.

The effects of cultivation were generally beneficial, for as a general rule the vigor, growth, health and productiveness of the trees were increased. Some of the growers thought that tillage was conducive to blight, while others were unable to detect any such correlation.

In seeding down, clover or red clover was again the most popular legume, as it was used thirty-three times, while alfalfa was used six times, alsike twice and white clover once. Of the grasses, timothy was sown in eighteen cases, Junegrass in six and self-seeded in eight, and red top in three. Again red clover and timothy took the lead as being the most popular combination.

Twenty-two, or forty per cent, of the orchards were used as pastures, although chickens were the only offenders in three cases. Hogs, calves, cows, sheep and horses were reported, the hogs being the most prevalent. Some injury was reported by both hogs and calves and also benefits from the former on account of their tearing up the sod.

Twenty-one of the orchardists reported that they removed the grass, six that they removed a part of it, and seven that they left the grass for a mulch. Forty-seven out of the fifty-five applied either manure or a mulch, and only three growers removed their grass without adding manure. The amount of manure added, of course, varied with each grower, but in nearly every case some benefit was obtained. A few of the benefits noted were as follows: It retained moisture and increased the size and number of perfect fruits, prevented deep freezing, reduced the amount of sod, increased the growth, vigor and health of the trees, kept down weeds, prevented washing of the soil and provided a good crop of grass.

It is readily seen that the orchard practices in this section are similar to those in the southeastern section. Young orchards are cultivated and intercropped, and later when they commence to bear they are seeded down. Manure is also applied to most of the orchards.

The third, or northeastern, section sent in six reports, and this small number is probably closely correlated with the importance of the fruit industry of this region. All of these orchards have been cultivated, but now two are in sod. The remainder are intercropped with small fruits and vegetables. Small fruits,

especially the raspberry, have caused injury in two of the orchards. Vegetables have apparently done no harm. Four growers stated that cultivation has increased the vigor, growth and productiveness of the trees, while one grower asserted that "tillage is a sure method of killing."

One of the sod orchards was in wild grass and the other in Junegrass. Grass was left in both of them for a mulch, with the exception that in one the grass was removed in the fall by cattle.

Cultivated orchard, mulched with straw manure, at University Farm, Minnesota State Agricultural College.

Manure was reported as being used in five of the orchards and with one exception its effects were considered beneficial. One grower applied in the fall, in addition to the manure, two bushels of sawdust per tree. The sawdust was removed in the spring, and he reported that it protected the roots and did not harbor mice.

Neither cover crops nor blight were mentioned, but, according to Dr. E. C. Stakman, no significance can be attached to the absence of blight, as it occurs in the northern part of the state.

The northwestern section also contributed six reports and, like the northeastern section, two orchards were reported as being in sod. Four of the orchards have been cultivated from two to ten years and no complaint of injury has been noted, and in fact an increase in health, vigor, growth and productiveness

was reported in three of them. Vegetables and small fruits were used as intercrops in three cases and no injury was noted.

Timothy, clover and alfalfa were used in the sod orchards, and the grass was left in one and the first cutting removed in the other. Five of the six growers used manures and two added fertilizers in addition. The fertilizer in one case consisted of lime and potash, and in the other of nitrates and potash. Whether the fertilizer was of any value or not is difficult to state, as probably no trees were left untreated for comparison.

Going south to the central-west section, the reports jump to thirty, and if this number is a criterion then this section ranks third in importance as a fruit section. Three of the thirty growers have used only tillage, twenty both tillage and sod, and seven only sod. Two of the three tillage men have been growing their trees two and five respectively, and perhaps they will seed their orchards down before very long. The third tillage man has cultivated his orchard fifteen years, but he thinks tillage is best when trees are young. One man has had his trees in sod for twenty years, and, like his compatriots, has noted no injury.

Five orchardists thought cultivation induced blight, eight that it increased the health of the trees, thirteen that it increased vigor and growth, and four that it increased productiveness.

As a general rule most of the orchards were seeded down when five to six years old, that is, when they commenced to bear. In fifteen, or one-half of the orchards, intercrops of vegetables and small fruit have been grown. The only reported injury was from the use of currants and gooseberries. No cover crops were mentioned. Red clover and clover were sown in eleven cases, alfalfa in three, alsike and white clover in two, timothy in ten, and Junegrass in seven. Timothy appeared by self-seeding in two more, Junegrass in three, and weeds in four. As in previous cases, the combination of red clover and timothy proved to be the most popular mixture.

Five, or one-sixth of the orchards, were pastured with hogs, cattle and calves, the first two kinds of animals being the most common.

Manure and mulches were applied in twenty-seven out of the thirty orchards and various benefits were noted, as an increase in size of apples, color of foliage and productiveness, and a decrease in the amount of sod. The amount applied, as in the other sections of Minnesota, is very variable and difficult to state in exact weights.

Twenty reports were received from the southwestern part of the state, and if this number has any relation to the size of the fruit industry, then this region holds a rank of fourth place. As in the other large fruit regions, cultivation is favored the first few years and then sod. Only three growers have practiced only tillage, fourteen both sod and tillage, and three only sod. Tillage was thought by eight growers to increase the health of their trees, by four to induce blight, by eleven to increase growth, by ten to increase vigor, and by four to improve productiveness. No mention was made of injury caused by sod.

Intercropping with vegetables and small fruits was noted in eleven out of the twenty orchards, and no injury was reported. Cover crops, one combination consisting of rye, rape and corn, and the other of weeds, were reported. The former was used for a hog pasture, and the latter was preferred to sod.

For seeding down, clover and red clover were used in six cases, white clover in two, alsike in one, timothy in three, and Junegrass in seven. Junegrass appeared in three additional orchards, orchard grass in one, and weeds in six. It is of interest that the Junegrass in this section was more prevalent than timothy.

Six, or over twenty per cent, of the orchards, were pastured with cattle, sheep, horses and hogs, the last named being most common.

Grass was left for a mulch in four orchards, part removed in four, and all removed in three. Eighteen of the twenty orchards were manured, and only beneficial effects were noted.

In summarizing the orchard practices in Minnesota, it is evident that most of the young orchards are cultivated and about one-half of them are intercropped with vegetables and small fruits. Later, when they commence to produce fruit, they are seeded down, usually with red clover and timothy. Throughout their life manure is applied freely, probably at first to feed not only the trees but also the intercrops and later to replace plant food removed by the grass and fruit. In other words, most of the Minnesota orchards are in sod, and their fertility is maintained by artificial feeding.

It is interesting to note that cover crops, which are so generally used in fruit regions in other parts of the country, are practically unknown in Minnesota, especially as two of their values are to mature wood and to prevent winter-killing of roots. Another point of interest is that only one grower out of 154 men-

tioned winter injury as due to tillage, and he was located in the northern part of the state. As was anticipated, negative and positive opinions were expressed as to the relation of cultivation to blight. In some localities, the injury from this disease is of minor importance, and probably by methods now advocated for its eradication it can be controlled in most every orchard. The consensus of opinion is that cultivation is of benefit to young orchards. If so, why shouldn't it be of benefit to bearing orchards, that is, where the soil does not wash and the moisture is not excessive? It has been definitely proven that toxic substances are derived from grass which are injurious to the growth of trees. Such being the case, perhaps the young trees, before their roots have penetrated deeply, are more subject to injury than those of older trees. However, many of the feeding roots of the old trees intermingle with the grass roots and undoubtedly suffer considerable injury. You may ask, does not the grass assist in maturing the wood? But if the wood of the young trees which are commonly cultivated is not injured, is that not sufficient proof that old trees will not suffer by the same treatment? Granting that there is danger of winter-killing, we can resort to cover crops to mature the wood and protect the roots. Thus considering "the pros and cons" for tillage and sod, it seems as if many orchards now in sod might be materially benefited by either an alternation of cultivation and sod or tillage, combined with the use of cover crops.

WHERE SHALL I BUY?—Beginners are very apt to ask this question. They have suspicion of nurserymen in general and ask the opinion of others as to some in particular.

"Is Black & Co. a reliable firm?" one asked the other day.

We like to believe all nurserymen are reliable, and that they aim to do as they agree and satisfy the buyer.

We are aware that mistakes are made, and dissatisfaction follows.

The prospective buyer should read up on the business, for the more familiar he becomes with the literature, the wiser will be his decision as to whom he will patronize.

Study and compare the catalogues. You can read much between the lines.

You can see where enthusiasm leads to extravagant claims, and which are moderate and sensible.

It is not the province of the Fruitman to point out this or that man as specially worthy of your confidence. There are scores of good men who will treat you fairly.—"The Fruitman & Gardener."

The Vegetable Garden.

AN EXERCISE AT LAST ANNUAL MEETING LED BY ALFRED PERKINS, MARKET GARDENER, ST. PAUL.

A Member: I want to ask about raising Brussels sprouts.

Mr. Perkins: That is a vegetable I have had quite a little experience with, but I find as a general thing the season here is pretty dry for it. We can get plenty of water, yet atmospheric conditions do not seem to be satisfactory as far as I can find out. Down on Long Island they raise very good Brussels sprouts, but they are surrounded by water, and I believe the atmosphere being charged with moisture in the fall of the year and not having the severe frosts we have, develops good Brussels sprouts. I have tried to grow them several years; I have had fairly good crops, but I must say in the majority of cases the crop was not satisfactory.

A Member: Mine seem to have little heads come on them, but the aphis ruin them.

Mr. Perkins: The best thing you can do is to spray with tobacco, nicofume or tobacco dust. A good plan is to put tobacco dust on the ground around the plants—or tobacco stems are good. I have grown them not so much as a money benefit, but just for an experiment and for exhibition purposes.

Mr. McBroom: I would like to know if there is anything being done in the way of storing celery by the St. Paul growers to bring it along to, say, Christmas time?

Mr. Perkins: Yes, it is practiced to a certain extent. There are a few growers I know that have tried to hold the crop for the holidays, but as a general thing I think most of the growers prefer to get rid of it. We are likely to have very severe weather, and then it lets up, and it entails lots of labor to take care of it. If you have it too much covered it is liable to rot, and if you don't have it covered enough it is liable to get frosted.

Mr. Baldwin: I had quite a little experience a number of years ago. I used to keep it until the latter part of February or March, but in late years that which comes so freely from California looks more attractive than the home grown, and it does not pay as well as it used to. I noticed along Lake Michigan, above Chicago, a very common way with them is to trench the depth of the plants and then put a layer about two plants thick, and then put a layer of dirt, six inches thick, and so on, and finally cover it all over with dirt. Let the dirt freeze until it will bear a man's weight. After you have a crust of frozen dirt over it then cover it with some material to keep it from freezing, using a space ten feet wide and as long as you like. In that way you can keep the tops in fairly good condition until March.

Mr. Perkins: Through Michigan that is practiced?

Mr. Baldwin: That was out from Chicago.

Mr. Perkins: Yes, the winter is not as severe as here. We get a cold spell, and we can't always get it out, and unless you

have a regular house for it it is quite difficult to handle it. I don't think we could handle it here the same as they do down there.

Mr. McBroom: The rise in price in the winter would make it profitable to handle if it could be done.

Mr. Perkins: I kept some one winter, and it kept in good condition, but I only did it once. Most of my attempts have been failures—I get it either too hot or too cold. Did you have a particular house constructed for it?

Mr. Baldwin: I have built them before now in pit form. There is a great deal of information can be secured very readily as to the construction of cheap houses. Make it with a board roof and make the roof come to the surface of the ground like a "V" and have it as long as you like. I have seen it in Massachusetts. But it doesn't seem to pay, as they ship in more attractive looking celery from California and other places.

Mr. Perkins: Do you think you could raise celery and sell it at the price of Michigan and California celery? Do you think you could compete with them? Do you think it would be commercially profitable today?

Mr. Baldwin: It depends entirely upon your market. If you have private customers who really like good-flavored celery it would be far superior to the California.

Mr. Perkins: Yes, I am certain of that. However, they ship the foreign stuff in in such large quantities, and they can hold it almost indefinitely in those large storage houses. I never saw any celery grown about the Twin Cities that can compete with the California celery in looks. It is such large stuff; it seems the conditions there are much more favorable to the development of celery.

Mr. McBroom: I would like to know if around St. Paul you use commercial fertilizer for celery?

Mr. Perkins: No, sir; I don't think so. There is very little commercial fertilizer used, plenty of stable manure to be had, although it is getting scarcer every year. However, there is still very little commercial fertilizer used. Once in a while you meet a man—Mr. Gibbs, I think experimented somewhat with it, not with celery but with other things.

Mr. Gibbs: The experience I had with it, it was about all I could do to get the commercial fertilizer to pay for itself. The price of commercial fertilizer is advancing, like everything else.

Mr. Perikns: You prefer to use ordinary stable manure?

Mr. Gibbs: Yes, sir. If we can't get that we might as well quit business.

Mr. Perkins: What is the highest price you can pay for stable manure for fertilizer, delivered on the ground? Do you think there is any limit to the price of it?

Mr. Gibbs: Yes; I don't believe it will pay if it costs more than $2.00 a ton, delivered on the ground.

Mr. Perkins: They are paying a good deal more in the East for it.

Mr. Gibbs: Yes, but they must get better prices than we do for the products. The prices we get for the products in a normal year wouldn't justify paying more than $2.00 a ton, delivered.

Mr. Reeves: I think $2.00 a ton would be the most we could pay at the prices we get in a normal year.

Mr. Perkins: I don't think you could get much at $2.00 a ton delivered. I think you have better market conditions up here than they have down East.

Mr. Rasmussen: I think we get more for our vegetables than they do in the East. I visited several of the eastern gardens last week or week before, and they don't get the prices we do. They use lots of fertilizer and still make ends meet. I think we make a mistake. They have their soil analyzed and see what it lacks; if we are going to use it we must do the same thing. We can't use commercial fertilizer with too much nitrogen in it if we need nothing put potash, and vice versa. I am going to have the University analyze the soil to see what items we are weak in and what strong, then I think we can afford to use commercial fertilizer.

Mr. Baldwin: We know very well that some crops require a great deal more than others of the different ingredients and you have to know for yourself if your crop needs a special amount of nitrogen. You have to study the crop you are going to raise. I have used a good many tons of commercial fertilizer in Connecticut and Massachusetts and have seen it sold for $40.00 a ton, and they got their money back in profits.

Mr. Perkins: What Mr. Baldwin says is true. We have to study the crop we are growing and furnish it with the necessary food. A lady was telling me that she was growing Chinese vegetables, and she is selling all her products directly to the consumer. cessful was as follows: She read up everything she could find on the subject of these Chinese vegetables and then studied each individual vegetable until she arrived at a place where she could grow them to almost perfection. I never saw such beautiful vegetables, and she is selling all her products directly to the consumer. As she says, she makes a study of the individual requirements. That is where we are lacking. We treat everything on the same broad principle, use the same fertilizer for everything, and if the crops do not turn out right we think it has something to do with the seed and blame the seedsmen.

Mr. Gibbs: Isn't it a fact that the use of a commercial fertilizer in a dry season usually results in failure, that it requires a good deal of moisture where you use a commercial fertilizer?

Mr. Perkins: Yes, sir.

Mr. Gibbs: I had that experience in 1910 in an onion patch. The rows were sixteen rods long and Professor Haglund, who was at the State Farm, tried seven different plots with commercial fertilizer. The cost was from $10 an acre to $30 an acre, and he took a plot a rod wide and sixteen rods long, a tenth of an acre. The season was very dry, and the result was on that seven-tenths

of an acre I didn't have a bushel of onions. They were all failures, all burned up, while Professor Haglund said that on the ground adjoining, manured with stable manure, there was a very fair crop. He said you couldn't use commercial fertilizer to advantage in a dry season, but the next season with the normal amount of moisture we had good success. The first year you could see bare places in the patch a way off, and it was four years after that before the plot showed up very good.

Mr. Perkins: You think then that the use of commercial fertilizer was detrimental?

Mr. Gibbs: It was detrimental, and it was four years before that was overcome.

Mr. Perkins: That is strange, but I believe that the commercial fertilizer is not very thoroughly understood even by the most experienced experiment station. I think they have a good deal of doubt and misgiving as far as I can make out.

Mr. Black: In my experience I find that we cannot tell just immediately, that is, the year we use the commercial fertilizer and the stable manure, we cannot form our conclusions which is the most profitable, because when we use stable manure we are giving humus to the soil, and when we are using commercial fertilizer the humus that is in the soil is steadily wasting away, and ground that does not contain a lot of humus requires moisture. We must give credit to the stable manure for the humus.

Mr. Perkins: I think it is generally said that to get good results from commercial fertilizer it is necessary that the land should be rich in humus.

Mr. McBroom: I would like to ask if there is any market for the new Chinese vegetables, especially Chinese celery and Chinese cabbages?

Mr. Perkins: I believe the market is going to be enlarged every year. The people like them, but the great drawback is the high price. Retailers charge a good price.

Mr. McBroom: Does the grower get a fair division of the profit?

Mr. Perkins: I don't know, it is still somewhat in the experimental stage. There isn't enough raised, and it takes a long time to educate people to the use of a new article; the retailers are afraid they won't sell. Swiss chard, for instance, you don't see on the market at all. I raised some here, but I couldn't sell enough to pay for the seed.

Mr. Rasmussen: I think the price runs about like that of head lettuce.

Mr. Perkins: Head lettuce retails pretty high just now because there is no home grown product, but in the summer time head lettuce retails around five cents a head, good head lettuce. I don't know what they charge for the Chinese cabbage, but, as I say, people are not used to it. I don't think there is any fixed standard.

Mr. Underwood: Is it practicable and easy to grow head lettuce?

Mr. Perkins: Yes, it is easy to grow head lettuce.

Mr. McBroom: In the heat of summer, in August?

Mr. Perkins: No, sir; that is not the time of year to grow it, unless you have the right soil and climate.

Mr. McBroom: But there is a demand for it.

Mr. Perkins: Yes, sir; there is a demand for it. Up at Duluth, where the weather is cool, they can raise excellent head lettuce. Around St. Paul and Minneapolis during the latter part of August and September there are only a few men I know who have success with it, and that is on account of the land mostly. Lettuce wants a cool atmosphere, it won't stand much heat.

Mr. McBroom: Does the Chinese cabbage do well in hot weather?

Mr. Perkins: No, sir; I don't think so. Mr. Rasmussen, have you had any experience with Chinese vegetables?

Mr. Rasmussen, Wis.: Yes, we grow a little; as the demand grows we will grow more.

Mr. Perkins: Your climatic conditions are different than ours?

Mr. Rasmussen: There isn't much difference. It is hard to grow in the warm months, it will go to seed. The time to have it come on is after the cool weather comes on. We grow some head lettuce in the summer. If you had a Skinner system to water it, it would be all right.

Mr. McBroom: Can you raise it under the Skinner system in hot weather?

Mr. Rasmussen: Yes, sir; not always, sometimes circumstances are against it. As a rule we expect to get it through with the water system.

Mr. Perkins: Whereabouts are you located?

Mr. Rasmussen: We are about in central Wisconsin. We are on the banks of Lake Winnebago, so of course we have a little more water.

RUST-RESISTANT ASPARAGUS.—According to the Weekly News Letter of the United States Department of Agriculture, under date of April 7, it is announced that small quantities of the stock of a type of asparagus that is so resistant to rust that it is practically free from injury even when exposed to severe infection are now available for distribution by the United States Department of Agriculture to growers for trial only. This type has been developed by the department in co-operation with the Massachusetts experiment station. Growers who desire to avail themselves of the opportunity to try it are asked to take the matter up with their county agent or state agricultural college, with whom the department desires to co-operate to secure a fair test between it and some standard variety, such as Reading Giant, Argentile, or Palmetto.

In the present distribution preference will be given to those sections in which rust is a serious problem, but the new strains have been tested for other qualities than rust resistance, and it is believed that in yield, type, and quality they are superior to stocks now in common use in regions where rust is of minor importance. The seed now available for distribution is from carefully selected, pedigreed plants from the best rust-resistant parent plants found in the course of the breeding experiments which have been carried on since 1906.

Destroying Mice and Rabbits.

C. E. SNYDER, PRESTON.

In this country mice and rabbits destroy more apple trees than all other causes combined. We have tried every method that we ever heard about or read of to protect the orchard from these pests. Wrapped with paper, wood veneer, screen wire, hilling with dirt, tramping the snow, etc., but in spite of all this every now and then a tree would be girdled worth anywhere from $10.00 to $50.00. So we concluded the only way to do was to kill off the pest. We tried poison of all kinds in different ways, strychnine and arsenic in all kinds of meal put in tin cans and laid on their side in corn shocks, under hay or piles of rubbish. Of course this gets some of them but not all by any means.

We find the best way to get all the mice is to get a half bushel of those little wood mouse traps. Can get them at any hardware store for about a penny apiece. Put ten or so of them in corn shocks in and about the orchards and have them baited with strong cheese. Get a careful boy or man to look at them twice a day, and he will find them full of mice for the first few days. Then they begin to get scarcer, but they will keep coming until you get every single one on the premises. The same bait will last for a good many days as they hardly get their teeth in it before they are caught. We have caught the traps full when there were cans of poison in the same shocks. Keep the traps set even after you think they are all gone, as some may run in from the groves or other fields.

The way to get all the rabbits is to go after them with a ferret. It takes three or four to do it right, as you must catch them as they come out of their holes or shoot them as they run, and we frequently find five or six rabbits in one set of holes. Go in the fall after it freezes up and then again after the first snow. Go over the ground thoroughly. After that you will find only few that run in from the neighboring groves or hills. Go after them again. It is great sport, and in a couple or three times you will have all the cottontails.

No Vine Crops in Small Plots.—It does not pay to grow the vine crops in very small gardens unless they can be trained on trellises at the side of the garden or planted on the area which has matured an early crop like lettuce, early peas, spinach, or radishes.

The vine crops are all warm season crops and cannot be planted in the field usually before June 1st. The growing season is so short that only the earlier varieties of muskmelons and watermelons can be matured from seed started outdoors. Cucumbers and squash usually mature if started the first week in June, but even they should be started in the hot-bed if an early product and a large yield are desired.—"Wis. Horticulture."

Everbearing Strawberries at Osage, Iowa, in 1916.

CHAS. F. GARDNER, OSAGE, IOWA.

At this time I must tell you what the result has been on our grounds in cultivating and handling the fall-bearing strawberry during the season just closed. Last January (1916) the whole country was covered over with a thick layer of ice, so heavy and dense as to shut out the air, so that the plants would suffocate. To prevent this we rolled all our strawberry patches with a heavy cast iron roller, well weighed down with stone. This broke up the ice in good shape and saved the plants. During early spring we had plenty of moisture, and some to spare, and vines got fairly well rooted before the long, dry spell commenced. As the aridity increased we intensified our work by cultivating twice a week and keeping a large hoeing gang steadily at work for a long time. In this way we brought our plants out in a green, healthy condition in spite of the intense heat, and picked and marketed over thirty thousand quarts of berries during August, September and October. The most of them were shipped in pint boxes. There were no extra large berries, as we had last season, when they run all sizes up to 5¾ inches in circumference. This year they just ran a fair size for market, but extra fine in quality. I never knew them to taste better.

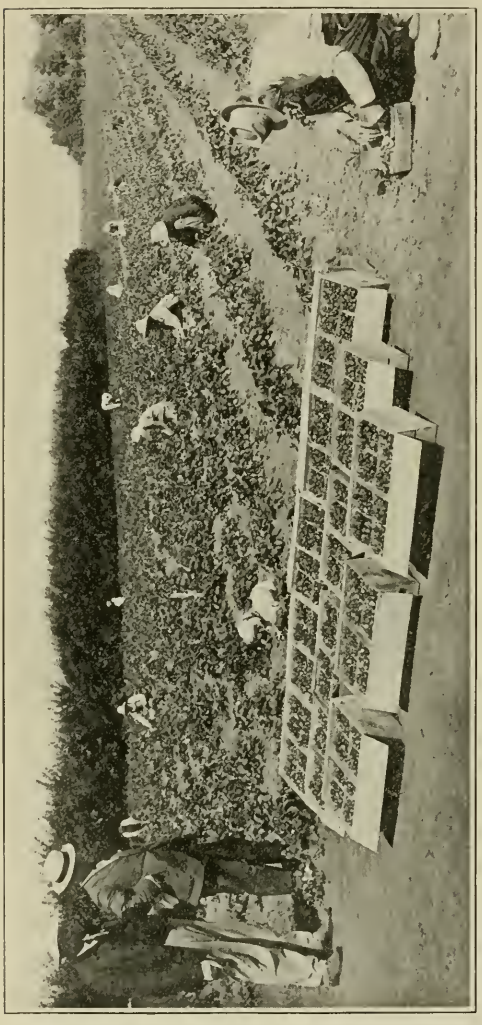
It was too dry for the Peerless, and they made a poor showing as compared with last year. One more good rain at the right time would have pulled them through up to their former record with a bound, but the required moisture did not come, and the result shows they cannot stand extremely dry weather as well as a good many other kinds. I shall watch them the coming season with great interest. This year we have gathered about forty pounds of fine clean strawberry seed from the best fall-bearing plants, which we shall keep for those who wish to experiment in growing seedlings and help us in our search for a plant that will take the place of those we are now growing. There is no end to this work, as there is always room for something better.

In July we were favored with a visit by Prof. Darrow, of Bureau of Plant Industry, Washington, D. C. He also visited us again in September. He tells us he wants to be with us a week or two next season (1917).

We did a little business the latter part of the season by starting a "preserving plant" and we put up 3,000 10½-ounce screw top preserve jars. Retail at twenty-five cents. We have com-

pared our product with "Heinz," "Beech Nut" and other brands, and we are willing to leave the verdict as to comparative quality to the consumer.

The two worst enemies that the strawberry grower has to contend with is the strawberry aphis (louse) and the white grub. It pays to dip all plants before setting in a solution of nicotine and water, mixing it according to directions on the can. This will kill all lice or lice eggs that may be on the plant. Ants plant the lice eggs on the roots just below the crown of the plant, where they hatch out, and the young louse proceeds to suck the sap out of the roots. Just a few lice on a plant will lower its vitality so it cannot do good business in making runners or bearing fruit, and in a few weeks the plant will dwindle and die. The ants personally do no damage to the plants, but they tend the lice after hatching as faithfully as we tend a herd of cows and for practically the same purpose. A weak solution of lime and sulphur can be used instead of nicotine. We used it in the spring of 1915; this year we used nicotine.



An everbearing strawberry field at Osage, Ia., in September.

Plant strawberries on clean, new land that has been well fertilized and under good cultivation for at least two or three years, being fall plowed every year. The reason of this, as every

good strawberry grower knows, is to remove all chances of the dreaded white grub. Read the history of these creatures, they are among the insects which undergo a complete transformation, and of which the pupa is inactive. They belong to the coleoptera order or species. The winged insect is our Junebug, which everybody knows as a winged beetle. They lay eggs in the ground and in rubbish, which hatch out, and the larva is about one-sixteenth of an inch long. At the end of that season it goes into the ground again, and the next spring it grows rapidly and becomes full sized larva (white grub). In the autumn these go into the ground and change to the pupa state. There is Junebug, egg, larva, full sized larva, then pupa and so on without end—taking three years to make the rounds. This is the kind that does so much damage in timothy grass land. There are more than a thousand varieties of these insects now on exhibition in our museums. Now, Mr. President, I want it distinctly understood that I do not claim to have the honor of first discovery in the facts related, because it was all known to Aristotle, who died 324 B. C.

There is no strawberry vine that is hardy enough to withstand the attack of the white grub or the aphis I have mentioned. They both mean disaster and death. You must prepare your ground in advance as I have stated. Remember, plenty of good fertilizer, and fall plowing is a good way to commence.

We use several tons of tobacco dust every season on our plants. We make first application just after setting. You need not be afraid to give several applications during the season. There is no insect that will fall in love with it. If it gets on the fruit it is easily washed off after the fruit is gathered. We wash nearly all the strawberries we put on the market. We use cold well water. We dry them in a cool cellar with an electric fan. They are all sorted and after being treated this way they will stand shipping much better.

Mr. Gardner: A year or so ago I read an article on strawberries, and I made the statement that I didn't know of any place in the United States where a single solitary plant could be found of the old Wilson Albany. When Mr. Darrow was at my place I spoke about that, of my idea that the Wilson had disappeared, and he told me there is a place in the United States where they still have the old Wilson, and that is in the Connecticut river valley. He says some parties there are still growing the Wilson strawberry.

A Member: What variety do you find to be the best shipper?

Mr. Gardner: I think the Progressive is as good a shipper as any of them.

A Member: I would like to know at what rate that tobacco dust is put on and how you put it on.

Mr. Gardner: I just take a small handful and put it on the plant; let it kind of spread as it goes down, get a little on the foliage and be sure to get some on the ground.

Mr. Kellogg: I have visited Mr. Gardner, and I am willing to believe all he says and swear to it. He has so many kinds, I want to ask him how many varieties he has that are better than the Progressive?

Mr. Gardner: I don't claim the variety has been found that is better. That is what we are working for. We may have plants that we think will beat it, but I don't know yet whether they will because it takes time to test them. I presume we have over a thousand different varieties.

Mr. Kellogg: You have got over two thousand different varieties.

A Member: Will it do any good to place tobacco stems upon strawberry plants?

Mr. Gardner: I don't think it does.

Mr. Thompson: Don't you think it would be easier and better to spray your strawberries than it would be to treat them with tobacco dust?

Mr. Gardner: Oh, I would do both. I think with the tobacco dust, if you can see the insects disperse and all those that have means of flying sailing through the air and see them dig out, you will have a kind of an idea of the consternation among the tribes that live down under the leaves. It shows, as I said before, there is no insect that falls in love with tobacco dust. I think it is all right. I think enough of it to use quite a number of tons every year.

A Member: How long does the effect last, one application?

Mr. Gardner: Until after a heavy rain.

A Member: Is it advisable to mix the everbearing strawberries for cross-pollenization with spring strawberries?

Mr. Gardner: No, sir; I would not.

Lily of the Valley in Cold Storage.—Pips not used up to this time, or only temporarily stored in frames for the winter, must go into cold storage proper. Repacking for cold storage is not absolutely necessary in the case of valley wintered over until now in cold frames, but to be on the safe side with that which is to be held back until late in the season the bundles if in any way dry should be dipped up to the crowns in water, and then be stood upright and close together in boxes, and instead of sand or soil dampened moss should be used in repacking. After the middle of March frames cease to be a safe place for Lily of the Valley. The stock to be forced soon will be all right in from twenty-six to twenty-eight degrees, while that to be held longer keeps best in from twenty-three to twenty-five degrees. Of more importance than degree is steadiness and while the temperature should never be more than twenty-eight degrees or lower than twenty-three degrees, the mark most easily maintained between these two extreme points should be held to right along with unwavering regularity so the pips will retain their strength.—Horticulture.

Liberty Gardens.

R. S. MACKINTOSH, AGRICULTURAL DIVISION, UNIVERSITY FARM, ST. PAUL.

Everywhere we go we find small and large plots of land planted for the first time in vegetables. In the past these emergency gardens have been called "War gardens." We now propose the name LIBERTY GARDENS. We have entered this war to protect our own liberty and to assist all others to enjoy the same privilege. If the vegetables produced in these gardens are properly used and conserved it means that the food supply of America and the world has been increased. The plea is going out in every way possible for the use of vegetables in place of wheat and meat. These two products are needed for war purposes. It is stated that Americans do not use as large a percentage of fruits and vegetables as they should. The proportion of vegetables is only about fourteen per cent. of the food used. The food administration authorities urge that the amount be increased to thirty per cent.

As horticulturists—the largest horticultural society in America—we are deeply interested in all that pertains to fruit, vegetables and flowers. If the people are to use more vegetables we should do everything that lies within our power to stimulate and support this change. How can we do it? We can set the example by doing it ourselves. Can and dry more vegetables. Use more vegetables every day of the year. As we are "setting the pace" then we can urge others to do the same thing. As Mr. Latham wrote earlier in the year, we are interested and the ones who know how to grow the vegetables and fruits, therefore we should assist all others who need help. Secretary Cranefield, of the Wisconsin Society, has urged that every member be a committee of one to look after the work in his own community. Do this by growing, eating, and talking about how to grow, how to cultivate, how to use, how to can, how to store, and the other *hows* that come up.

How many quarts of canned vegetables and fruits can you use? Do you not believe that every family should have at least twenty-five quarts of canned vegetables for every person in the family? This has been suggested as the minimum amount. The more used the better. If each person saves a little wheat and meat it means a big saving when it is multiplied by 125,000,000—the number of persons in America.

My Prize Orchard.

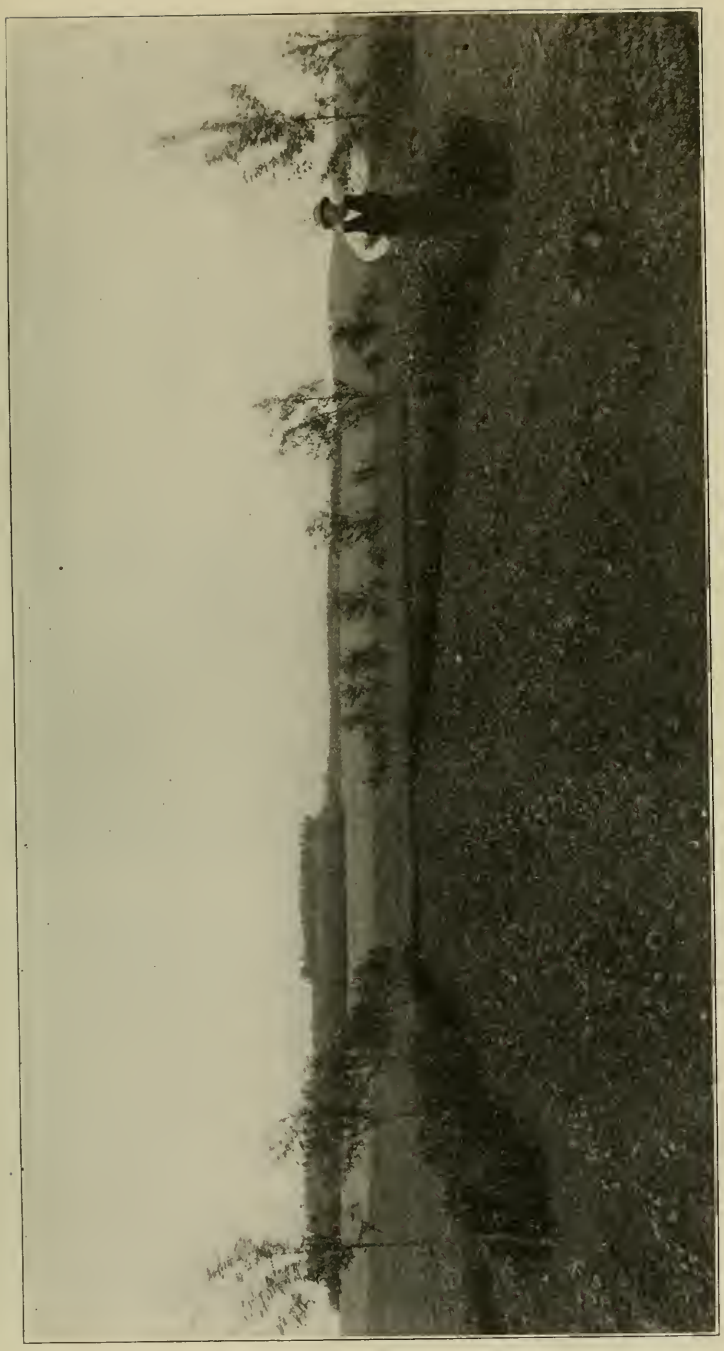
HENRY DUNSMORE, OLIVIA.

In April, 1914, when I planted my prize orchard the land was in a high state of cultivation. The rows were laid out north and south, and east and west, and the trees planted twenty-five and thirty feet apart. The land was staked off, using a stake for every tree. After the outside rows were measured and straightened the inside stakes were sighted both ways and driven into the ground.

The holes were dug three feet in diameter by two feet deep. The hole was then filled with surface soil, making it sixteen inches deep, ready to receive the tree. The trees were planted by sifting fine earth among the roots and packing with the hand so that no air spaces were left. After the roots were covered the earth above the roots was stamped down with the foot as solid as it was possible to make it. The hole was filled up and the stamping process continued, leaving the top soil loose and slightly below the level of the ground.

During the summer the trees were cultivated once a week until the middle of July, when cultivation ceased. The trees have made a very good growth, and all are alive. No blight has appeared among them. With two exceptions the trees are in perfect health. Canker spots appeared on the trunks of two trees, but the diseased parts have been cut out and the wounds sealed over with grafting wax. A light mulch of coarse litter spread about the roots and kept four inches clear from the trunk has been applied each winter since planting. In 1914 vegetables of different kinds were grown between the rows; in 1915, potatoes; in 1916, navy beans, which proved to be the most profitable acre on the farm, yielding a net profit of $60.00.

THE HONEY DEW MUSKMELON.—The Honey Dew muskmelon attracted considerable attention on our markets last season, and a few growers have been contemplating planting in quantity. The Honey Dew is of the semi-Casaba type; in fact, it is said to be a cross between the Casaba and the Colorado Netted Gem. The Casaba requires too long a season to be grown successfully in our climate. The few tests which were made of the Honey Dew last year indicate that this variety also requires a long season. If the plants are started in dirt bands, a longer season can be provided than normal and by this means there is a possibility that the Honey Dew can be grown successfully here. In view of the doubts in the matter, growers are advised not to plant this melon in quantity, but to devote their time and land to crops of certain success and of high food value.—C. E. Durst, "Market Growers' Journal."



Prize orchard of Henry Dunsmore, Olivia. Set in 1914.

Liberty Breads to Save Wheat and Meat.

In the propaganda to save wheat in this country many suggestions have been made by various persons. One is to have wheatless days. Probably the most important is to use other cereals as corn, rye, oats and barley in place of, or in conjunction with, wheat.

Miss Josephine E. Berry and her associates of the Home Economics Division of the Agricultural College, have spent weeks studying these problems, and they have prepared a number of excellent recipes, which should be available to all bread makers.

Note: In all the following proportions a half pint measuring cup is used, and all measurements are level. The flour is measured after sifting.

Yeast Cornmeal Bread.

One and one-fourth cups liquid (milk and water), two tablespoons sugar, one tablespoon fat, two teaspoons salt, one-half cake compressed yeast softened in one-fourth cup liquid, two-thirds cup cornmeal, two and one-third cups flour.

The above proportion makes one loaf of bread.

Directions for Making Yeast Cornmeal Bread. Add sugar, fat, and salt to liquid and bring to boiling point. Add the cornmeal slowly, stirring constantly until all is added. Bring to the boiling point. Remove from the fire and cool. These proportions of cornmeal and water result in so thick a mixture that to add the given amounts of flour looks impossible. It can be done, however. Add compressed yeast softened in one cup water. Add flour and knead. Let rise until about double its bulk, knead again, and put in pans. When light, bake in a moderate oven for at least an hour.

If dried yeast is used, a sponge should be made from about one-half cup liquid taken from the amount given in the proportions and some of the flour. This is allowed to rise before adding the cornmeal mixture and the remainder of the flour.

Yeast Oatmeal Bread

One cup liquid (milk and water), two tablespoons sugar, one tablespoon fat, one teaspoon salt, one-half cake compressed yeast, softened in one-fourth cup liquid, one cup rolled oats, two and one-half cups wheat flour.

This proportion makes one loaf of bread.

Scald liquid and pour over rolled oats, sugar, salt, and fat. Let stand until lukewarm. Add yeast softened in warm water. Add flour and knead. Let rise until double its bulk. Knead again and place in pans. When light bake forty-five minutes to one hour in a moderate oven.

Steamed Brown Bread

One cup cornmeal, one cup bread crumbs, one-half teaspoon salt, three-fourths teaspoon soda, one cup sour milk, one-half cup molasses.

Mix cornmeal, crumbs, salt, and soda. Add to sour milk and molasses. Steam three to four hours. Bread may be dried off in the oven for about fifteen minutes.

Oatmeal Cookies (Rocks)

One cup sugar, one-fourth teaspoon salt, one cup fat, two eggs, two-thirds cup sour milk, two cups raw rolled oats, one-half cup cut raisins, two cups flour, one-half teaspoon soda, one-half teaspoon cinnamon, one-half teaspoon cloves.

Mix sugar, salt, melted fat, and eggs. Add sour milk, rolled oats, and raisins. Add flour, soda, salt, and spice sifted together. Drop from a teaspoon onto oiled pans, leaving an inch space between cookies. Bake in a hot oven.

Oatmeal Muffins

One and one-half cups milk, two eggs, two tablespoons fat, two tablespoons sugar, one teaspoon salt, two cups rolled oats, one cup flour, four teaspoons baking powder. Pour milk over oats and let soak one-half hour. Add eggs and melted fat. Add to dry ingredients which have been sifted together. Bake 25 to 30 minutes.

To Use Sour Milk

All of the muffins and griddle cakes may be made with sour milk in place of sweet milk. To do this, use one-half teaspoon soda to each cup of sour milk, omitting two teaspoons of the baking powder called for.

Rye Yeast Bread

One cup liquid (milk and water), two tablespoons sugar, one tablespoon fat, one teaspoon salt, one-half cake compressed yeast softened in two tablespoons water, two and one-quarter cups rye flour, two and one-quarter cups wheat flour. Combine ingredients. Mix into dough and knead. Let rise until double original bulk. Knead again. When again double in bulk, bake about forty-five minutes.

Potato Yeast Bread

Note: The following amounts make three loaves of bread: One-half cup liquid (milk and water), four tablespoons sugar, four tablespoons fat, one and one-half teaspoons salt, one-half cake compressed yeast softened in one-quarter cup water, four cups boiled potatoes, eight cups flour. Combine ingredients. Mix into dough with about six cups of the flour, and knead. Let rise until double original bulk. Knead and add remainder of the flour. When again double in bulk, bake about one hour.

War-Time Recipes.

MRS. E. W. GOULD, PRES. MINN. STATE GARDEN FLOWER SOCIETY, MINNEAPOLIS.

We are asked, in order that we may share enough food to feed our allies, to save wheat, fats, meats and sugar, the last to be saved by doing without frosting on our cakes, candy and soft drinks, which will not be a hardship to any of us.

The wheat saving recipes have most of them appeared in our daily papers, so most of those given below are those conserving meats, fats and eggs. These are recipes collected from various sources, and so changed through years of use that they are nearly new. They are given with the hope they may be of help to us in our "Hooverizing," as I call this act of patriotism, —helping our country to make the food "go around." Doing this is part of our "bit," just as much as rolling bandages and knitting. It is even more urgent.

Delicious Vegetable Soup (*without meat.*) Two quarts boiling water, one small carrot, one turnip, one parsnip, two onions, chopped rather fine; one heaping teaspoon butter, one heaping teaspoon sugar, pinch of soda. Boil one hour. Add four potatoes chopped, one-half cup rice (uncooked). Boil forty minutes. Then add two cups scalded milk, salt and pepper.

Stuffed Egg Plant (*meat substitute.*) Boil an egg plant until tender. Scrape the inside all out, mash and add one level tablespoon butter, one-half to three-quarters cup bread crumbs, salt and pepper to taste. Then put back in the shell and bake at least one-half hour. Serve in the shell. Onion juice may be added to the egg plant if liked.

Butterless and Eggless Cake. Will keep well. Two cups sugar, two cups water, one package seeded raisins. Boil five minutes after it begins to boil. Let cool. Add two tablespoons shortening, one teaspoon salt, one teaspoon cinnamon, one teaspoon soda, one-half teaspoon cloves, two teaspoons baking powder and three cups of flour. This is called "War-Cake," these amounts making one large or two medium loaves.

Cocoanut Indian Pudding. One quart milk, one tablespoon cocoanut, two tablespoons corn meal, one tablespoon minute tapioca, one-half cup sugar, one-half teaspoon salt, one tablespoon butter. (This can be omitted if the pudding is served with cream.) Bake slowly one hour.

Small Bread Pudding. One cup bread crumbs, one pint milk, one egg, two tablespoons sugar, one-quarter teaspoon salt, one teaspoon butter, flavoring. Bake slowly one-half hour. Serve with any preferred sauce or jelly. One tablespoon of grated chocolate makes this a chocolate pudding.

Gingerbread (*without butter or eggs.*) One cup molasses, one-half cup sugar, one tablespoon (large) bacon fat or other shortening, one teaspoon ginger, one-half teaspoon salt, two and one-half cups flour. Stir together and add one cup boiling water in which has been dissolved one teaspoon soda.

Steamed Pudding. One cup molasses, one cup sweet milk, two cups graham flour, one teaspoon soda, one-half teaspoon salt, one-half teaspoon cloves, one-half teaspoon cinnamon, one-half cup seeded raisins. Steam three hours. Serve with any preferred sauce.

Potato Puff. One cup mashed potato, one-half cup milk, one tablespoon melted butter, one egg beaten separately, one-quarter teaspoon salt. Add last the stiffly beaten white of egg. Bake fifteen or twenty minutes and serve hot.

Corn Omelet (meat substitute.) Four egg yolks beaten, four tablespoons milk, two cups green corn, one teaspoon salt, one tablespoon sugar, four egg whites beaten stiff. Mix first five ingredients, fold in the egg whites. Turn into a greased omelette pan and cook slowly until brown underneath. Then brown in the oven.

Corn Chowder (meat substitute.) One pint boiling water, one cup macaroni, one and one-half cups corn (fresh or canned), four potatoes cubed, one sliced onion, one quart milk, one tablespoon (large) salt pork fat or bacon fat, two tablespoons flour, one-half teaspoon salt, one-eighth teaspoon pepper, six large crackers.

Cook macaroni in boiling water twenty minutes. Add corn, potatoes and onion. Boil until potatoes are soft. Add fat. Thicken milk with the flour, and add to corn mixture. Add seasonings and pour into a tureen containing crackers. Serve hot in soup plates.

Cheese and Nut Loaf (meat substitute.) One cup grated cheese, one cup bread crumbs, one cup chopped nuts (any kind), two tablespoons melted fat, two tablespoons lemon juice, one teaspoon salt, one-eighth teaspoon pepper, two tablespoons chopped onion, one beaten egg (can be omitted), one tablespoon flour, one-quarter cup water. Make into loaf and bake fifteen to thirty minutes.—Girls' Vocational School Cooking Class.

Boston Loaf (meat substitute.) Two cups cold cooked beans, one-quarter pound grated cheese, one-half cup bread crumbs, one teaspoon salt, one-eighth teaspoon pepper, one tablespoon chopped onion, one-half cup chopped celery, one egg (may be omitted), water enough to mix into a loaf. Bake fifteen to thirty minutes.—Girls' Vocational School Cooking Class.

Mock Peach Pickles. Take smooth green tomatoes. Boil them in equal parts of vinegar and water until the skin can be removed. Stick four or five whole cloves in each after removing skins. Make a syrup of five pounds of sugar to a quart of vinegar. Boil the tomatoes in this gently so as not to cook to pieces. When they look clear and are tender put them in crock or jars. They will not be at their best for three months, but are delicious after that time.

Spider Corn Bread. One and two-thirds cups corn meal, one-third cup flour, two cups sweet milk, one cup sour milk, three-quarters cup sugar, two eggs, one small teaspoon soda, one-half teaspoon salt, butter, or substitute, size of an egg. Dis-

solve soda in one cup sweet milk. Beat eggs light, add milk in which soda was dissolved, sour milk and dry ingredients. Have a spider very hot on stove. Melt butter in it, greasing the sides well. Pour in mixture. Then add on top of this the other cup of sweet milk, but do not stir it. Place spider in hot oven and bake from twenty to thirty minutes.

Orchard Observations.

P. H. O'CONNOR, MINNEAPOLIS.

In the past ten years I have been on some of the finest and best fruit farms in New England and have watched the processes of spraying, trimming, cultivating, and planting, and let me say right here that in Minnesota the trees are planted too close. If the trees were planted thirty to thirty-five feet apart they could be sprayed from the ground and the fruit picked from an eight foot step ladder instead of an extension ladder. The trees should be pruned with a pruning knife or a saw to let the sunshine properly color the apples. I am a thorough believer in the vase shaped fruit tree. The limbs should start about two feet from the ground, and if there is danger of the tree splitting it should be wired.

The apple was one of the earliest settlers in New England although it might not have been indigenous to the soil. It followed the settlers into the back woods and up the mountain sides, and grew beside the cabin door, extending its pleasant branches for the children to play under, and dropped its fruit almost into the laps of the people. The fruit was hard and bitter compared with the apples of today, and would not keep through the winter, yet it added immensely to the simple diet of our ancestors. Nature, ever ready to be bountiful, unexpectedly dropped into the laps of those people some very great gifts. Wherever children threw away apple cores, or wherever pomace from the cider mills was thrown, apple trees sprung up, and many of these were marvelous trees. The Rhode Island Greening, the Yellow Bellflower, the Baldwin, and a number of other good varieties came forth spontaneously. They were nature's gift. We can truthfully say that the apple is the king of fruits. Out West, in Oregon and Washington, this king of fruits is crowned. The people almost fall down and worship it. If there is anything under the sun that the apple needs the people bring it to it. When they put the apple up on exhibition, they put garlands of flowers around the boxes, and trim them up with flags and bunting, for they believe the apple is the king of fruits. What do we do? We treat it like a beggar. We do not give it scraps from the table. If we have a little time we do not know what to do with we go and trim the apple trees. Some people use an ax and trim the lower part of the trees and neglect the top. The apple tree gets just what it can. It lies at our door like Lazarus in the Bible story, full of sores, and we do not seem to care anything about it. Let me give you a motto: "Boost the apple and it will boost your state."

Premium List, Annual Meeting, 1917.

THOS. REDPATH, GENERAL SUPT.

All entries must be made with the Secretary at least *one week before* the date of the annual meeting, and blanks may be secured of the Secretary for this purpose.

All exhibits must be in place by 10:00 o'clock a. m. of the first day of the meeting to be entitled to compete for premiums, except as noted.

Exhibitors competing must be members of this society and growers of the articles exhibited.

All bulky articles must be brought in through the rear entrance to the hotel and by elevator to the second floor, where the exhibition is to be held.

FLORAL DISPLAY.

W. H. Bofferding, 710 No. 2nd St., Minneapolis, Supt.

PLANTS.

To be staged Monday p. m., December 3, 1917.

	1st.	2nd.	3rd.
Collection of 12 specimen Palms	$20.00	$15.00	$10.00
Collection of 12 specimen Ferns	10.00	7.00	4.00
Collection of 12 specimen Blooming Plants	15.00	10.00	6.00

(Covering 25 square feet.)

VEGETABLES.

Exhibits to be set up Monday p. m., December 3, 1917.

N. H. Reeves, Minneapolis, Supt.

	1st.	2nd.	3rd.	4th.
Beets, 1 peck	$2.50	$1.50	$1.00	$0.50
Cabbages, 3 heads	2.50	1.50	1.00	.50
Carrots, 1 peck	2.50	1.50	1.00	.50
Celery, 1 doz. stalks	2.50	1.50	1.00	.50
Celeriac, 1 doz. roots	2.50	1.50	1.00	.50
Lettuce, 1 doz. heads	2.50	1.50	1.00	.50
Onions, 1 peck Red	2.50	1.50	1.00	.50
Onions, 1 peck White	2.50	1.50	1.00	.50
Onions, 1 peck Yellow	2.50	1.50	1.00	.50
Onions, 1 peck White Pickling	2.50	1.50	1.00	.50
Parsley, 1 doz. bunches	2.50	1.50	1.00	.50
Parsnips, ½ bushel	2.50	1.50	1.00	.50
Potatoes, Early Ohio, 1 bu.	2.50	1.50	1.00	.50
Potatoes, Rural type, 1 bu	2.50	1.50	1.00	.50
Potatoes, Triumph, 1 bu	2.50	1.50	1.00	.50
Potatoes, Burbank, 1 bu	2.50	1.50	1.00	.50
Pie Pumpkins, three specimens	2.50	1.50	1.00	.50
Radish, fresh, 1 doz. bunches	2.50	1.50	1.00	.50
Salisfy, 1 doz. bunches	2.50	1.50	1.50	.50
Hubbard Squash, three specimens	2.50	1.50	1.00	.50
White Turnips, 1 peck	2.50	1.50	1.00	.50
Rutabagas, ½ bushel	2.50	1.50	1.00	.50

SEEDLING APPLES.

Four specimens (not less than 2½ inches in diameter) must be furnished of each variety exhibited.

Entries of seedling apples can be made only by owner of the original tree or his sole authorized agent. Competition is open to all except on such varieties as are being propagated for sale by some person other than the originator.

Competition in seedling apples is open also to the western half of Wisconsin, the northern third of Iowa, and all of North Dakota, South Dakota and Manitoba.

Premiums will be divided pro rata among the entries scoring 60 or upwards.

Before payment of premiums awarded on seedling apples, a history and description of the tree and its fruit may be required. Blanks with suitable questions will be furnished for this purpose.

N. B.—The judges will, at their discretion, change entries of seedling apples from either class to the other.

EARLY WINTER SEEDLING.—The fruit shown must not have been kept in cold storage. Premium $40.00, to be divided pro rata.

LATE WINTER SEEDLING.—Same conditions as for early winter seedling except that if found necessary the fruit shown may be retained and final decision reserved until later in the winter. Premium $60.00 to be divided pro rata.

In each of the above two classes the varieties receiving the three highest awards will be designated as having received first, second and third premium, respectively.

APPLES (not including crabs.)

No inferior fruit can be shown.

	1st.	2nd.	3rd.
Each variety (may or may not have been in cold storage) included in the 1917 fruit list of the society, or in the 1917 premium list of the Minnesota State Fair	$0.75	$0.50	$0.25
Collection, not to exceed ten nor less than six varieties	$20.00 to be divided pro rata		

TOP-WORKED APPLES.

Collection of named varieties grown on scions top-grafted on other trees. Accompanying the name of each variety, shown on the same label (to be furnished by the management), must be noted the name of the variety on which it is top-worked. $40.00 to be divided pro rata.

PECKS OF APPLES.

Peck of any variety of apples, the fruit exhibited to be at the disposal of the society. An exhibitor may enter a peck each of as many different kinds as he pleases. $40.00 to be divided pro rata.

BOXES AND BARRELS OF APPLES.

Must have been packed by the exhibitor.

Only one variety (not less than 2¾ in. in diameter) can be shown in a box. Bushel boxes of the standard size must be used. Awards will be based on the quality of the fruit, packing, etc.

Box of any variety of apples, including seedlings. An exhibitor may enter a box each of as many different varieties as he pleases. $50.00 to be divided pro rata. Also 1st $10.00, 2nd $5.00.

	1st.	2nd.	3rd.
Barrel of apples, any variety, $40.00 to be divided pro rata. Also	$15.00	$10.00	$5.00

$100 SEEDLING APPLE PRIZE.

The sixth prize of $100.00 will be awarded this season "for the best late winter seedling apple keeping till March 1st under ordinary cellar conditions" under the offer made first in 1905, restricted, of course, to the contestants who have duly registered.

NUTS

	1st.	2nd.	3rd.	4th.
Each variety of edible nuts, one quart	$1.00	$0.75	$0.50	$0.25

CANNED AND DRIED FRUITS AND VEGETABLES.

Collection of canned fruits and vegetables (either or both) in quart glass jars. $40.00 to be divided pro rata.

	1st.	2nd.	3rd.
Collection of dried fruits	$3.00	$2.00	$1.00

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

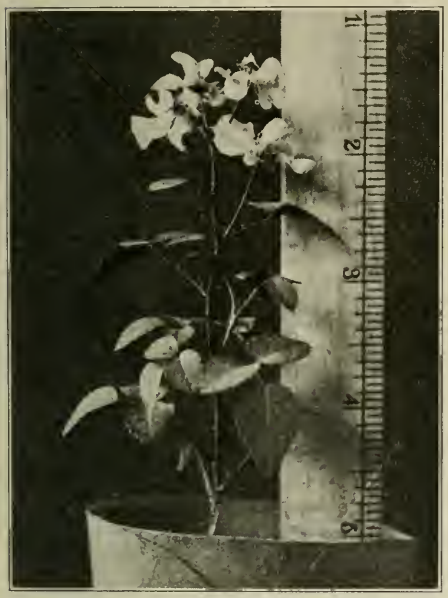
Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So. Minneapolis.

The September meeting of the Garden Flower Society will be held September 14th, 2:30 p. m., at the Wilder Building, St. Paul.

Program—"Bulbs and Their Artistic Planting," "Succession of Bloom in the Bulb Garden," "Fall Planting."

Early this spring a premium was offered to the member who secured the greatest number of new memberships in our society, the contest to close the day of the June flower show. Mrs. F. L. Moffet was the winner in this contest, sending in nine new members.

We wish it was possible to give the premium—a year's subscription to the Garden Magazine—to all who worked so hard to increase our membership, as several made a very good showing. As that is impossible, we are going to hold another competition for new members, giving as a premium for the greatest number of new members, from September first until March first, a beautiful garden basket, that any one of us would be glad to own. So get busy, remembering that all memberships after August first will hold until December, 1918.



The Midget Rose.

Visit our Garden Booth, in the Woman's Welfare Building, at the State Fair this year.

Throughout the summer we have been sending an auto load of flowers each Saturday morning to the sick soldiers in the hospital at Fort Snelling. This will be continued as long as we have any flowers in our gardens this fall. Flowers can be left at the home of your president, either Friday night or Saturday morning before 9:30. Mrs. James Jennison kindly gives her auto and her services each week and takes them down for us. We wish to thank her for this gracious act.

It will be more difficult than ever to get good seeds next spring, so save any of fine flowers or vegetables you may have, being sure to store them in a dry place and label them clearly.

Last March, at our meeting in St. Paul, we gave out the seeds of the Midget Rose, or Rosa multiflora. The little rose in bloom, of which a picture is given, was exhibited at our spring non-competitive flower show early in June by Mrs. M. S. Countryman, who also sends us the picture taken at that time.

This proves that the seedsman did not exaggerate when he said it would bloom "three months from seed." Mr. E. Meyer, who has grown this variety, gives us the following:

The Midget rose is the only rose that will bloom the first year from seed. It is hardy out of doors if protected the same way as a Hybrid-Remontant or a Hybrid Tea Rose. It makes a good pot plant and with proper care will bloom indoors all winter. The plants should be selected after they have bloomed for this pot culture, to avoid spending time on an inferior plant.

N. W. PEONY AND IRIS SOCIETY.

W. F. CHRISTMAN, Secretary.
3804 Fifth Avenue South, Minneapolis. Minn.

The N. E. Minn. Horticultural Society gave an exhibition of peonies in Duluth, Minn., July 17th and 18th, that was a pronounced success in every way. Many fine flowers were shown and deep interest manifested. A beautiful silver cup, donated by the Duluth Commercial Club, for the best exhibition of peonies, was awarded to Judge F. H. Cutting. A great deal of the success of the show was due to the untiring efforts of their president, Oliver S. Andresen, and the secretary, V. D. Vincent, who were ably assisted by Mrs. H. Nesbitt and Mrs. E. L. Kimball. The interest and enthusiasm manifested seemed to be shared by all. They are planning a still better exhibition next year.

Make frequent examinations of your peony clumps and should you detect any stalks wilting or dead, examine carefully for the cause. Remove any dead stalks that you may find, together with the soil directly surrounding the affected stalk, as this is one of the best means of preventing further contamination of the balance of plant. The stalk may have been eaten off by a grub, broken off by the wind or by some careless person passing through the field, in which case there is no need to bother, but if Botrytis, or Root Rot, is the cause the future health of your plant depends upon the entire removal of the affected parts. Recently upon examining some plants the writer discovered where a worm had entered well up on the stalk and eaten its way down to the crown of the plant. This, of course, caused the stalk to wilt and die. No damage had been done to the crown of the plant.

One of our Philadelphia members reports considerable damage in that section to their iris, due to an iris worm. I quote from his letter as follows:

"The young worm makes its way into the leaf near the top and works its way downward. If a sharp lookout is kept at flowering time and for some weeks afterwards and the worm is prevalent the punctures can be seen on the leaves, and these should be cut off low enough and then burned. In this way the insect is kept in check, but if this is neglected for several years all your plants may be ruined by a sudden onslaught. It is also well to clean up all rubbish around the plants at the end of the season, thus destroying a harboring place for the insects. I use no mulch whatsoever on my bearded iris for this reason, but whether that would be safe in your severe climate I, of course, do not know."

Have any of our members discovered this pest in this section?

As we are about to publish another bulletin, I would greatly appreciate suggestions and items of interest from our members.

Don't fail to include one or more of the high class varieties of both peonies and iris in your fall planting. Let's better the standard of both peony and iris plantings and awake to the greater possibilities that lie before use in the realm of beauty. It will well repay you for the additional cost.

If you have not already ordered your peonies and iris for fall planting you should make up your order at once and send it in to the dealer. In the Northwest the last two weeks in September and early October is a very desirable time to plant peonies. They may, of course, be planted considerably later and still give a good account of themselves.

I would be pleased to receive some good pictures of your garden or of specimen plants of either the peony or iris. I want to have some cuts made and printed to show our members what others are doing along the line of growing peonies and iris.

SECRETARY'S CORNER

Lice Can't Stand Water.—Mr. Shane, at West Salem, Wis., had failed to clean a Rambler rose of lice with tobacco water or soap suds. Then he tried hot water, a little hotter than he could hold his hand in, dipping the shoots twice, and it cleaned all the lice and red spider off, and his rose was a beauty.—G. J. Kellogg.

State Agriculturist Goes to Balkans.—Prof. Francis Jager goes Monday, August 20, to Washington, D. C., from where he will go with a Commission as Major in U. S. service, for a Red Cross Survey of the Balkan States, especially Servia, returning about December 20th. He expects to bring back with him a number of the exceptionally fine pure bred queen bees of the Italian and Carniolan races from the Balkans and northern Italy, but especially from the government queen mating station in Switzerland.

Attention, Beekeepers.—All Minnesota beekeepers should make a special effort to attend the 1917 State Fair, observe carefully the first year's results of a new management and classification of exhibits, spend considerable time at the exhibits of the University Division of Bee Culture and Minnesota Beekeepers' Association, and be sure to watch for a notice and attend a special meeting of exhibitors, Minnesota Beekeepers' Association members and the honey judges—all in the Bee and Honey Building. Use the University Division of Bee Culture and the Minnesota Beekeepers' Association as sources of all bee information.—L. V. France, Secy. Minn. Beekeepers' Assn.

Horticultural Society at the State Fair.—It is expected that the State Horticultural Society will maintain an office in the Horticultural Building at the State Fair during the entire period of the fair. In that case the secretary—and at times probably other officers of the society—will plan to be in attendance and will be very glad to meet members of the society, not only those with whom we have a personal acquaintance, but especially members whom we have not personally met. The location of the office is likely to be adjoining the north door of the Horticultural Building, although this point has not yet been definitely decided. Don't fail to look up the headquarters of the society when in attendance at the State Fair.

Are You Doing Your Part?—Every effort has been made and is still being made to secure preservation by canning and drying of as large a quantity of fruits and vegetables as is in any way possible. Are you doing your part in this? There is no doubt that the world is threatened with a shortage of food, and it is the part of wisdom that every effort should be made to increase the supply while there is yet time and opportunity. Considerable space to this subject has been given in this magazine the past months, and some is used in this number. We wish to emphasize the supreme importance of this appeal, which should find full response with every loyal member of this society.

Biennial Meeting, American Pomological Society.—Notice is out for the regular meeting of this organization, which occurs every two years. This meeting will be held in Boston, October 31 to November 4. The notice does not say in what building the meeting will be held, but as the meeting is to be a regular meeting of the Massachusetts Horticultural Society, it will, without doubt, be held in the splendid building of that society. The New England fruit show will be held also in connection with it, and it is up to Minnesota again to capture the Wilder Medal, which has already been done.

For full information address E. R. Lake, Secy., 2033 Park Road, Washington, D. C. If any of our members are contemplating attending this meeting, we should be glad to hear from them in good season to secure for them an official standing with the Pomological Society.

SCORE CARD TO BE USED IN JUDGING VEGETABLE GARDENS.

1.	Arrangement, systems of companion and succession cropping	15
2.	Straight, even, well-filled rows, proper spacing of plants	10
3.	Cultivation and care of plants	15
4.	Freedom from weeds, insects and diseases	15
5.	Varieties; importance of and proportion of most valuable crops	15
6.	Yield (approximate or actual)	30
		100

Prepared by R. S. Mackintosh for the Minn. Extension Division in judging garden contests.

NATIONAL VEGETABLE SHOW.—The Vegetable Growers' Association of America is to hold this year at Springfield, Mass., a first national vegetable show, and a premium list for this show has been prepared and can be secured by addressing Eastern States Exposition, Springfield, Mass. As the regulations require that all entries must be made by September 1, this notice will reach you too late to take any part in this show this year. We understand, however, that this is to be an annual affair, and another year Minnesota, either through individuals or through some of its strong vegetable associations, should certainly make a show of Minnesota vegetables—none better in the world—at the National Vegetable Show. Secure premium lists and become acquainted with the situation.

Since writing the above, it has come to our knowledge that the new State Vegetable Growers' Association, organized here last spring, has already made arrangements to make an exhibit at this show. We expect to hear good things of what they accomplish there.

PREMIUM LIST FOR ANNUAL MEETING.—In this number is to be found a list of premiums to be offered by this society at the next annual meeting, to be held, probably in Minneapolis, the first week in December. There will be noted some radical changes in this list from that of previous years, namely, the increase in the apple department, and the addition of a special forty-dollar premium for collections of canned fruits and vegetables. This collection may consist of either fruits alone or vegetables alone or both, and this year especially when there is such a effort being made to secure an unusual amount of canned and dried fruits, this ought to bring out a considerable display. There has been a radical increase in the premium offered on top-worked apples, emphasizing the special value of this class of apple trees, this following the rather severe winter of 1916 and 1917. A considerable increase will also be noticed in pecks, boxes and barrels. These premiums, with the interest which our membership has in this annual display, ought to insure a large exhibition.

STORE FRUIT FOR THE WINTER MEETING.—Arrangements have been made with Booth Packing Co., as for a number of years now, to receive and care for fruit to be exhibited later at the annual meeting of the society. Tags for this purpose have been prepared and can be had at this office upon application for any quantity. Specimens gathered for this purpose should be free from blemish, not green or over-ripe, but well ripened up to the point where they are however still firm. Do not send to cold storage fruit that is already mellow; it will disappoint you in its keeping qualities. It will probably be more convenient for you to send to cold storage all the fruit you plan to exhibit at the winter meeting, except seedling apples, which must be kept out of cold storage. All fruit so stored will be held at the expense of the society, and delivered without further charge to the exhibitor at the place of meeting the day preceding the opening of the meeting. Of course you will want to have some part in this splendid exhibition which the society will put up this year.

PARTIAL VIEW OF BUILDINGS DEVOTED TO HORTICULTURE AT IOWA STATE AGRICULTURAL COLLEGE, AMES, IA.—PROF. BEACH'S WORKSHOP.

(See opposite page.)

While it is not the intention to publish anything in this magazine that is misleadng or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 OCTOBER, 1917 No. 10

The Unfruitful Tree and How to Correct It.

PROF. S. A. BEACH, HORTICULTURIST, AMES, IA.

We grow orchard trees primarily for fruit. Some people seem to forget that and grow them for wood, but as horticulturists we do not recognize that standard. The orchard tree is grown, or should be grown, for fruit. What is the condition, then, that we wish to secure in the tree?

PLANT FOOD: In the first place, we must recognize that the tree cannot make fruit out of nothing. It has no such magic ability. It must work; it must do its appointed work in order to produce fruit for the reproduction of its species, of its kind. What is that work?

Well, in the first place, it must establish itself in the world. Take the apple, for instance—it is easy for me to talk about the apple; I have thought about it so much my mind naturally runs in that channel. What is the natural home of the apple? It is indicated by the present botanical name. The botanists keep changing the name every few years, and it is hard to keep track of it, but they call it *Malus sylvestis*, that is to say, "the apple tree of the woods." It is found, I am told, in its native state in forests. Any tree that naturally grows in forests, the first thing it must do in life is to make a place for itself. If it started at once to fruiting it would be crowded and shaded out of existence by the taller trees which overtopped it. So the very first thing that the young tree must do—and that is evidently bred in the bone and sinew (so to speak) of the apple tree—the first thing it must do is to send its roots deeply into the ground and send up its trunk as rapidly as it can into the sunlight, where it can fight for life. So we find the first condition in the early life of the tree is a condition of rapid vegetative growth.

After it has established itself the next thing for it to do is to make out of the materials at hand that with which it can reproduce its kind, that is to say, fruit and seed. It then begins to think about producing fruit buds, speaking figuratively, and about bearing fruit. We then have in the period of slower growth a mature condition which is favorable to the reproduction of its kind. We must understand the philosophy of these different conditions of growth to handle our trees most intelligently: First, the period of vegetative growth which is not conducive to productiveness; and, second, the period of more mature but of slower growth which favors fruit production.

In growing an orchard our first desire then is not to bring it at once into bearing. Many young trees have been injured by allowing them to bear heavily when they are young and before they have gotten themselves well established. The first thing we ought to do with a young tree is to give it a good, thrifty, vigorous growth and make a framework fit to carry heavy loads of fruit.

There are various things, as we know, that must be considered in getting that kind of growth. In the first place, we must see that the soil conditions are favorable. If there are periods of a week at a time in which the soil is full of water, and the water stands there stagnant, it has just the same effect upon the tree as it has on the corn field. The cornstalks will begin to turn yellow under such conditions of stagnant water. They are asphyxiated; they are suffocated. The little fine feeding roots are choked out of existence because they cannot get the air which it is necessary for them to have in order to do their work, in order to carry on the vital processes of taking in plant food and of living and growing.

One of the things which we horticulturists do not sufficiently recognize is the fact that the roots must have air to carry on the vital processes of root growth and activity. Down in the cypress swamps of Louisiana you will find cypress trees sending up great "knees," as they are called, three or four feet tall or more. These are great growths of porous wood coming up from the roots, and sticking up above the water. What are they for? They are hollow inside; they are simply contrivances of the plant for getting air to the roots.

We, as orchard men, as fruit growers and as agriculturists, must recognize this principle, that roots need air. How far

would the florist get in growing his crops on the greenhouse bench or in pots if he didn't recognize the necessity of drainage underneath to give an opportunity for the air to get to the roots? He wouldn't get very far. And the man who wishes to bring his orchard up to the highest degree of production also must provide for the aeration of the tree roots.

That may mean tile drainage. It may mean the introduction of more vegetable matter in the soil to make it more porous. It may mean a certain amount of surface drainage. But we shouldn't make the mistake of thinking because we have good surface drainage we necessarily have good under-drainage; the contour of the layers of subsoil or clay underlying the surface doesn't always follow that of the surface. Just before coming here I went into a field where we are digging a trench. There is excellent surface drainage and no standing surface water where we are. Only three feet below the surface we struck water in this year, which has been so dry that good cisterns have failed. We have found that although it has a sufficient slope to carry off the surface water, this land must be tiled to get best results in growing orchard trees. I don't know your soil, but I can tell you this one principle of soil management, and that is, to get the most out of your tree it must have air for the roots.

SECONDLY: Orchard soils should have a constant supply of moisture because the trees take all of their food in the form of soup. The Lord hasn't provided them with jaws and teeth with which to masticate their food, and they must simply suck it in. If you put the end of a towel in a wash basin and let the edge hang over you know what it will do, draw all the water out of the wash basin. In the same way the little fine roots will draw up the soil water and pass it on to the trunk and branches.

That material as it comes from the soil is not in such form that the tree can immediately transform it into wood and into leaves and fruit buds. It is crude material. It is, as you might say, comparing the tree with a furniture factory, the lumber that goes into the factory and not the finished furniture; or, comparing it to a foundry, it would be the raw iron and coal that you take into the foundry rather than the finished foundry products. So the soil solutions are simply the crude materials out of which plants are made. Where are these crude materials changed into the forms that the plant can use? It is in the green foliage by the help of the energy of the sun that the

oxygen of the air and the earthly materials brought out of the soil in the sap undergo chemical changes and are built up into elaborated plant food that nourishes the tree. It is such material only that the plant can digest and assimilate and make over into plant tissue.

We must then remember this principle, that if we are to get the most out of the tree we must protect its foliage. Keep that in good working order. How else can the plant make its food? It needs abundant and vigorous foliage. Whenever as horticulturists we allow insects or diseases or anything else to injure or destroy the foliage, in that way destroy the working power of the plant, it is like taking the money out of our pockets, money which we fail to get, because we do not have as much fruit to sell or to use in the family, which practically amounts to the same thing.

It isn't necessary for me here to dwell upon the methods of spraying for the protection of the foliage. That is a matter which has been discussed frequently. Plenty of information about it can be had from your experiment stations. The thing I wish to do now is to emphasize again the importance of keeping the foliage in good condition if you are going to expect results out of the tree.

PRUNING. We prune for two purposes. *First,* to give the tree a framework upon which to load the fruit—try to grow the tree in such shape that it can withstand the heavy storms and winds and loads of ice and snow, as well as loads of fruit. That isn't a matter of pruning for fruitfulness; it is a matter of pruning for a good mechanical framework. Then, having pruned to shape the tree from the standpoint of giving it ability to hold heavy crops of fruit, we have another important thing to consider, namely, pruning the tree so as to make easy the operations of spraying and of gathering fruit. Take this as a general rule: When a man has in mind the opening up of the tree in such a way that he can spray all parts of it easily and thoroughly, he has a pretty good rule for pruning, because, in making the tree sufficiently open so he can reach it easily with the spray he makes it sufficiently open so that the sunlight can reach all parts of it. He accomplishes two things: Opening the tree so he can spray it for protection against diseases and insects and opening it so that the sunlight can get to all the leaves and the tree can make the food it needs to grow fruit and fruit buds.

When the tree is in a condition of rapid, vigorous growth it is possible to check it, as the last speaker has indicated. I am in hearty accord with the position he takes that it is better to do more pruning in the dormant season (if you are pruning for productiveness) than it is to prune during the growing season in June. Why? Because the leaves which are put out in the early part of the season are made, not out of the plant food that the plant makes that same season, but they are made out of the plant food that was made the previous season and was stored away in the roots and all through the body, trunk and branches. When it is dissolved in the sap in the spring then it comes out into those fruit buds and leaf buds and furnishes them the material out of which the tree could expand its leaves very rapidly.

Those of you that have lived in a country where they make maple sugar know that sometimes they get a run of sap in February or March. What happens there is the changing over of the food materials, which have been stored away in solid forms, back into liquid forms, so that it can flow all through the tree to any part where it may be needed for the development of the leaf buds or fruit buds. If you prune after the tree has drawn upon all that reserve material to make its first leaves in spring, then by cutting off those new leaves you cut off proportionately more from the food factory of the tree than you do by pruning in the dormant season. Why? Because if we prune in the dormant season we are taking away a part of the top. Its portion of the solid food which has been stored away in the roots waiting for the spring demand remains so that the branches which are left have that much extra supply of food material with which to stimulate their growth. We know as a rule if we wish to stimulate the growth of a branch we should prune it rather short in the dormant season.

But we shouldn't stimulate it into such rapid growth as to overcome its tendency to bear fruit. We do not want to put it in the condition of a very young tree by forcing an excessive growth of vegetation. What is better is to stimulate slightly the growth of the tree by pruning lightly in the dormant season.

Pruning in summer, or rather the pruning in early summer, just after the first leaves have come out, has a tendency, as we know, to check the growth. In case you have a tree that is too exuberant in its growth it is desirable, perhaps, to adopt that method. There is no one rule you can use alike for all trees, for

the young tree, the old tree, the exceedingly vigorous tree and the slow growing tree; we must simply get at the principles underlying those things and then adapt them to the variety and its condition of growth.

FERTILIZERS. In our experience one of the most important things in bringing the tree into profitable productiveness is to give the ground a good application of manure occasionally, say every three or four years put on eight to ten tons to the acre. You get out of that more than the beneficial effect of the fertilizer, you put more humus into the soil, and it increases its capacity to hold moisture and so gives the tree a continuous supply of moisture for carrying on its work.

We have an orchard which we took hold of in 1910 for experiment purposes. It was then an orchard in full bearing. As I recall it, the trees were about eighteen years old. The orchard was not in good condition. The land had been farmed until it was pretty badly run out before the orchard was planted. When we got hold of it the ground was all covered with rose briers and other things that go with that kind of cultivation or lack of cultivation. We took hold of it in June. The season of 1910 was characterized by a very late freeze, which took the fruit off the trees in all that region, so we had no fruit that year. The following year, 1911, we had our first crop of fruit from that orchard, which was 1,700 bushels. The next year we got 3,500 bushels. We began to prune and spray all of it, and portions of it were cultivated so that we were putting it into better condition for productiveness. The first year was 1,700, the next year 3,500, the next 2,000 and the next year 4,300. In 1915 we got 6,000, and this year, 1916, we will have at least 4,000, and probably more than that.

This is an orchard which two years ago we fertilized by a good dressing of stable manure. We have had crops, as you see, every year during all this period since 1910. What have we done besides manuring it once to make productive that orchard which formerly was unproductive? We have pruned as needed but not heavily. We have pruned sufficiently so that we can spray readily. We have sprayed for the protection of the foliage against the attacks of insects and diseases. Since we are carrying on an experiment in cultivation and cover crops, some of the plots have been cultivated, some have been put in clover sod and some in blue grass for the purpose of comparing these different kinds

of soil treatment. One point I wish to call attention to here, is this, that as a result of applying stable manure on the part of the orchard under experiment, as compared with the part not manured, it is evident that we have made money by using manure. That simply confirms general experience and observation, namely, that it is a good thing to give an occasional dressing of manure to the bearing orchard in order to keep the ground fertile and also to keep it full of humus, so as to increase its capacity to hold moisture.

Summarizing this discussion as to treatment of the unproductive tree to make it more productive, I would say:

1. Recognize the fundamental principles of growth, distinguishing between the condition of rapid vegetative growth and the condition of slower mature growth favorable to the formation of fruit buds.

2. Make the condition of the soil such that the roots will be comfortable the year through—they can't run away when it is too cold, and they can't get in out of the wet when it is too wet—they must stay there. Make the soil conditions such that it will be comfortable for the roots all the year round.

3. Prune according to the needs of the tree. If the need is to promote the vegetative growth, direct your pruning in that way; if the need is to check the vegetative growth, direct your pruning that way. Above all, prune so that the sunlight can get to all the foliage in the tree and so that you can spray all parts of the tree thoroughly.

Mr. Kellogg: How long does it take a fruit bud to mature?

Prof. Beach: Ordinarily, in the case of the apple, the first indications that we can distinguish under the microscope of the development or the beginning of the development of the fruit bud are about the last of June. It has not been seen earlier than that. The progress of development is more or less rapid, according to the varieties and conditions, until fall. In the case of the plum the different parts of the fruit bud will be pretty well developed by fall; in the case of the apple the different parts are not so distinctly developed before spring. One of the troubles with the apricot is, it carries fruit bud development so far that it is caught almost always by the spring frosts or freezes.

Mr. Kellogg: How about a twig or a scion that will produce a fruit blossom that season, at the closing up of the season?

Prof. Beach: That might occur, but it would be out of the ordinary, it would be abnormal.

Mr. Kellogg: Some trees do that every time.

Prof. Beach: There are differences among varieties that way, just as we find among strawberries. Ordinarily the strawberry forms its fruit bud so as to have strawberries in June, but we have so-called everbearing variations that will give us fruit in August, September and October. Then, too, the same variety acts differently in different seasons. After a prolonged period of summer drought some kinds of fruit trees will blossom after fall rains come.

Mr. Hawkins: Is it injurious to cut apple limbs as large as one to two inches in diameter late in the fall, or this time of the year, and does it pay at all to trim old orchards?

Prof Beach: Perhaps I ought not to try to answer that question because there are Minnesota men who know Minnesota conditions that can answer it better. I should say that I would prefer not to do heavy pruning of that kind until after the severities of winter are past, because there is danger of climatic injury to the exposed tissues. As to whether or not it is better to prune the old orchard trees, I would either prune them or blow them out, I wouldn't leave them as they are.

Mr. Kellogg: How do you account for the heavy fruit in that experiment orchard year after year? Orchards generally bear themselves to death in one year.

Prof. Beach: I might say the trees haven't been overloaded generally. We have given the tree an opportunity to make fruit buds every year; that is to say, we have kept the foliage healthy, and we have tried to make the soil conditions satisfactory, maintain fertility and keep a good, constant supply of moisture for the roots. In other words, we have given the tree a chance to make fruit buds every year and at the same time to carry a crop of fruit every year.

Mr. Drew: In regard to tiling, I had a notion to remove some tiling that passed by some cottonwoods, and when we took the tile up we found that it was filled full of roots.

Prof. Beach: Roots of cottonwoods, elms and willows will go a good ways to get a drink. Apple roots don't go so far. I think there is little danger of apple roots filling the tile unless there is a constant flow of water. Where you have tile taking off the surface water only, that is, only the ordinary run-off, probably there will be no difficulty of that kind.

Mrs. Franklin: I would like to ask a question. A neighbor's apple tree just came into bearing last summer, and when that intense hot weather came on the leaves all dried and fell off, as did also the fruit. Do you think there is any danger of that injuring that tree for future fruitage? There were quite a number of trees that were affected similarly. These were affected the worst, and the leaves just shriveled right up; the trees looked like they do in the middle of winter, without a sign of life.

Prof. Beach: How old was the tree?

Mrs. Franklin: That I don't know, I know it just came into bearing, just a small tree.

Prof. Beach: Does it stand in sod or cultivated ground?

Mrs. Franklin: In sod and it is in heavy clay soil, that is, most of his soil is heavy soil, and I fancy there is some where the tree stands. It was on the lawn where it was all sod.

Prof. Beach: Trees will do that. They will drop their leaves in the extreme hot weather in order to protect themselves. They cannot keep up the supply of water necessary for the leaves, and they simply drop the leaves. In severe cases they will also drop the fruit. The question at once comes up, has the tree stored enough material in it to properly ripen the wood and carry it through the winter successfully? That is a question it would be hard to answer. I have known instances where such trees would come through all right and grow a crop next year. But the conditions you have described show that the tree is suffering from lack of water during the dry season, and it needs attention to the soil to make it fuller of humus so that it can hold water better in order to carry the tree through.

Mrs. Franklin: Wouldn't it be a good plan in a case like that to take up the sod around the tree and remove it, fertilize it thoroughly and not have the sod up close to the tree?

Prof. Beach: Yes. My advice would be to cover that soil deeply with manure this fall, so as to give the roots that are there a chance to get as much moisture as possible during the winter and to help supply what will be taken from the branches, because the branches will evaporate moisture during the winter. Then in the spring I would spade around the tree a space as wide as the spread of the branches and mix with that some well rotted manure. You cannot do that in orchard conditions, but in special cases you can.

Mr. Clausen: What difference do you find, if any, in the cultivated and uncultivated plots where the trees are in bearing?

Prof. Beach: We have had some difficulty in getting the different orchard plots into condition so we could make reliable comparisons. The clover seeding was burned out at different times on account of the hot, dry weather. However, we have finally established the condition of blue grass sod in one plot, and I can say this of the plot we have now established in sod, the yield is going down all the while as compared with that where we are giving cover crops and tillage. That simply supports the results that were obtained in New York state in the work I started there, which was afterwards reported on by Professor Hedrick in the New York Station bulletins on tillage and cover crops in orchards. That work was through a period of ten years. It showed much better yields with tillage and cover crops than in sod. Those of you who recall the experiment will remember that the ten acre orchard was divided lengthwise through the orchard, one-half in sod and the other in tillage. After several

years it was divided again crosswise, so that one-quarter which had been in sod was put in tillage, and one-quarter that had been in tillage was again put in sod. Immediately the results began to work in the same general way as before, that is to say, the trees that went into sod began to lose their productiveness and those that were changed from sod to tillage came up again in yield.

Mr. Husser: I would like to have the professor tell us in what good spraying consists and what power is necessary for doing the most efficient spraying.

Mr. Philips: I want to make a short statement I think has a bearing on this question. A neighbor of mine last summer, who has an outlet into the sewer, put down either three or four inch pipes for tiling, but it clogged up and stopped at the house, and he hired a man to find out about it. There was a rose bush some distance from the house, and they found the tile entirely clogged with roots, from that bush, that had come through the joints. So be careful when you put in tile or any pipes underground not to do it near where there are roots. The roots will fill them up so the water can't pass through.

Prof. Beach: The question is what constitutes good spraying and what power to use. I referred yesterday to the Underwood orchard, which was sprayed in the season of 1915 and again in the season of 1916 by a farmer who had just taken up spraying. He had only about 3½ acres of orchard. He wasn't in position, or thought he wasn't, to buy a good power sprayer. What he did do was to get a common barrel pump. With a barrel pump he couldn't keep up a very strong pressure.

However, they did good enough spraying with comparatively low pressure so that that orchard, which before had been unproductive, I understand, brought in in 1915 something over $600 gross receipts, and in 1916 over $800 gross receipts. I wouldn't want to say that was the most effective spraying, and yet it was done with a barrel pump, in which I doubt whether they maintained a pressure of more than fifty or sixty pounds. However, I would prefer to have spraying done by an engine and a pressure of from 100 to 150 pounds.

There is this feature where you drive the spray onto the foliage or onto the fruit with a pressure of 150 pounds, you wet the fruit as you don't do with a spray that goes on at a pressure of fifty or sixty pounds. You throw that spray against the fruit with such an impact that it wets the surface of the fruit. A gentle spray or mist collects in fine particles on the fruit, but it will not thoroughly wet the fruit. There's a difference between having the surface thoroughly wet and having a mist lying on the surface. You are, I believe, more apt to get spray injury from spraying with a heavy pressure than with a light pressure. The important thing about spraying right is to do the work thoroughly. You can't kill a codling moth unless you

put the poison where he feeds, and if you leave a third of the fruit surface of the tree untouched you have exposed 33 1-3% of the fruit to the attacks of the codling moth as compared with where you have covered everything thoroughly.

Many men who have sprayed say it does no good. Why? First, because they don't do a thorough job; second, because they don't do it at the right time. The statement as to when to do it is put down in the bulletins and in the spray catalogs of one kind and another. If I should tell you now you would forget it. Send to your experiment station or extension department and get their printed statement, or to your spray manufacturer and get a statement from him. Get instructions and then carefully follow them, and you will find it will make a lot of difference in the results. Spraying must be done timely, must be done thoroughly and done with the right material. (Applause.)

A Winter Garden in the Cellar.

N. A. RASMUSSEN, MARKET GARDENER, OSHKOSH, WIS.

I am going to speak of one crop we do not spray, so we won't get into much difficulty. I will direct my remarks more to the ladies, the young folks and the city people. There are, no doubt, some city people here, and I think they too should have gardens as well as the farmers, and have them almost all the year round. It matters not how small a piece of land you have, you will have room enough for a garden anyway.

There is a place in Milwaukee where I visited, and during my conversation with the hostess she said she was sorry she did not have a garden, but she did not have any place for it. I told her I thought she had. I walked around the house and found all the space she had was a piece of ground between the house and the sidewalk two feet wide and six feet long. I told her it was plenty to raise a great many of her vegetables, and I am going to tell you in a few words what she raised that season.

In the first part of March, the season being a trifle earlier there, she started with radishes, having first mixed the soil with thoroughly rich manure. She wanted some tomatoes, and I informed her how to transplant them and train them to stakes. She had Hubbard squash that she trained on the side of the house. The vine grew thirty odd feet long and in the fall she had nine squash on it that went over twelve pounds apiece. She also had pole beans, lettuce and chives, and the whole thing made as pretty a picture as you ever saw.

In North Milwaukee, which is a suburb of the city, where there are mostly wealthy people, everyone has to have a garden. They arrange with some gardener to visit their gardens from time to time and direct the work, and it is surprising to know the results they obtain.

Now about the *garden in the cellar.*—Rhubarb is the easiest vegetable to grow in the cellar. This is more for the home garden, the commercial gardeners know how to go about it. It is not too late (Dec. 1) if you have a hill of rhubarb in the backyard to dig it up, and you will have some fun with it if you don't have profit. The roots should be three years old or more. To get plenty of rhubarb from one hill dig it up now and set it on top

This helps to solve the berry picking problem at Mr. Rasmussen's.

of the ground where it will freeze. Let it freeze for a couple of weeks before you take it in. At the end of this time take it in, put it in a barrel and cover it with soil, ashes or sawdust. I prefer the latter because it is clean. After you put three inches at the bottom of the barrel set the clump of rhubarb in and pack it thoroughly around the outside with the same material, dirt, sawdust or ashes. You must arrange it so the water won't run out on the floor when you water it.

Then set it in the cellar and cover it with carpet or burlap so that it is perfectly dark. If it is light you will grow large leaves at the expense of the stalk but if you keep it thoroughly covered the leaves will not be more than three inches across.

Water it occasionally, keeping the packing damp all the time, and you will grow more rhubarb than if that hill had been left out in the field the next summer. The rhubarb takes no nourishment from the soil, it stores it while it is growing a top, and by

not growing a leaf you get twice as much stalk. It is very fine to have in winter, and it sells for around twenty cents a pound.

A Member: If you are talking about twenty cents a pound you are not selling on this market.

Mr. Rasmussen: I am talking about the retail price. Remember the dealer must have nearly half in order to live; it depreciates in weight very fast. There is not much sale at that time of the year, and he must have a big margin. If the dealer is paying eight cents and getting fifteen he is not making too much.

Mr. Smith: How long does it take to grow that?

Mr. Rasmussen: It depends on the heat in your cellar. I should judge about five weeks.

Mr. Richardson: How would it do without a furnace?

Mr. Rasmussen: It doesn't make any difference, it will grow as long as it isn't freezing, in other words, over forty degrees. I have grown some at thirty-five, but it should be from forty to sixty degrees.

Mr. Brown: How about the water?

Mr. Rasmussen: It wants to be kept moist.

Mr. Richardson: Will they do well at seventy?

Mr. Rasmussen: That is a little warm. I don't think any basement will be that warm. If you get near a door even in a furnace-heated cellar I don't think it will get above sixty. I think it would be too warm, and it would dry out too fast. Asparagus can be grown in the same way. Green onions packed in a shallow box as close as you can get them, covered with sawdust, if they have light will have a finer flavor than if grown outside. You can also grow beet greens. Onions and beets must have light, and rhubarb and asparagus must be kept dark.

A Member: They must have more heat?

Mr. Rasmussen: Not necessarily; you can hurry them along if it is very warm. You know an onion on a cold cellar floor will sprout and grow.

A Member: Will the asparagus store its food in the field?

Mr. Rasmussen: It stores up all its food the year before. The asparagus never stores any food until one stalk is grown up, a branch opens up a little bit of a leaf, then it starts to store food. This is why we should never cut it too young in order to have it store up food for the next year.

A Member: Does the rhubarb have to freeze?

Mr. Rasmussen: We always let it freeze.

A Member: Do you wet the mulch first and then pack it?

Mr. Rasmussen: We never do; we pack it first and wet it afterwards, but we keep it damp all the time.

Mr. Roberts: What kind of onions would you use? Would you use the little sets?

Mr. Rasmussen: You may, but I prefer a good sized onion for that purpose, I think it does better.

A Member: Small onions?

Mr. Rasmussen: Not necessarily small. When onions are not worth over a dollar a bushel we grow them in sawdust commercially, and we think we double our money. You can take your winter onions at this time of the year and pack them in the cellar, just like the rhubarb, with good results. We dig a good many of the onions at this time, let them freeze and put them in hotbeds along the middle of February and start them growing.

A Member: Can that rhubarb plant be put back in the garden in the spring?

Mr. Rasmussen: It can, but it would take two years for it to overcome that severe checking.

Mr. Baldwin: You take a sharp pointed shovel and take only part of the hill, cut the hill right in two, and it will come right along, will do all the better for reducing the size of the clump. I find it works very well in the cellar not to take up the whole root.

Mr. Rasmussen: Yes, sir, it will, but I prefer taking the whole clump, and then in the spring cutting it to the right size, although the other way is also practiced.

Mr. Baldwin: Don't the plant lose a lot of nourishment through the fresh cuts?

Mr. Rasmussen: I don't think so. People that are not used to handling them might not have good success in trying to divide them, therefor I prefer taking the whole clump.

A Member: What time would you take them up? Now?

Mr. Rasmussen: It is just time to take them up now.

Mr. Black: With a foot of frost?

Mr. Rasmussen. We haven't any frost in Wisconsin. We were plowing when I left home. Maybe it is too late here.

A Member: How many kinds of rhubarb are there?

Mr. Rasmussen: There are several kinds on the market. We have a fine variety; I cannot say just what it is as it was on the place when I bought it. I have been saving the seeds and raise my own plants. It is one of the wine plants.

A Member: Does the seed come true?

Mr. Rasmussen: Almost always. Occasionally we see a light colored plant and throw it out.

A Member: You save your own seed?

Mr. Rasmussen: Yes, sir, it costs practically nothing to strip off a few handfuls.

A Member: I always had a failure that way; where one plant out of three or four hundred would be of commercial value the rest would be green.

Mr. Rasmussen: Did you save your seed or buy it?

A Member: Bought it.

Mr. Rasmussen: If you save the seed from the right kind of plant it will generally come true to kind.

Boys and Girls Garden and Canning Clubs in Minnesota in 1916.

T. A. ERICKSON, EXTENSION DIVISION, UNIVERSITY FARM.

Three thousand boys and girls took part in a garden and canning project of the Boys' and Girls' Clubs in Minnesota in 1916. By the rules of the contest, each club member competing must grow a garden not less than one square rod in size, while one-tenth of an acre is urged. Each member must also learn to take care of waste and surplus products by learning to can them by using the cold pack method of canning. Each boy and girl taking up the work keeps a note book in which is recorded the daily garden operations. Cost of supplies, seeds and work is carefully recorded. At the close of the season's work each member sends in a report of his or her work, as well as a story on "How I Grew My Garden, and How I Learned to Can."

It has been found that the most effective way of doing the work is by organizing the contestants into groups, called clubs, with a regular set of officers, meetings and plan of work. A large number of these garden and canning clubs have been organized this year. Play is mixed with work. The "Club Day" is sometimes made up of field meetings in the gardens, lunch together, a program with games and sports.

The canning work is made a special feature because we need to teach our boys and girls:

(1) How to save products going to waste.

(2) More canned fruits, greens, and vegetables will save many a doctor bill, and it is

(3) One of the best ways of teaching thrift and economy.

Winners.—The winner of first place in the South Central Section is Mary Ramey, of Maple Lake, who is also a member of the prize winning club. Mary has grown a fine garden and has canned 197 quarts of vegetables in both glass and tin. Edna Burch, of Kanabec County, who wins first place in the North Central Section, comes from a club of thirty-five gardeners, at Mora. Each has grown a garden 50x150 feet. Edna has a record of 100 quarts canned.

Phoebe Darling represents the Northern Section of the state as winner with a record of a prize winning garden and nearly 100 quarts canned.

The Maple Lake Club, which stands highest of any club in

the state, is composed of nineteen girls who have grown their gardens and have canned some 1,500 quarts of their products. They have been encouraged by a mothers' club which has canned several thousand quarts.

Helen Rich, of Maple Lake. champion canning girl of the State.

The ten young gardeners who stand highest in the work next to the five named, and who are on this account entitled to membership in the Minnesota State Horticultural Society, have all made splendid records and are as follows:

1. George Anderson, of St. Peter. George is a member of a Boys' Garden and Canning Club of eighteen members. This club of boys grew splendid gardens, held an exhibit where was shown more than 200 lots of vegetables, fresh and green. The boys arranged for a canning contest in spite of the fact that a circus was in town the same day.

2. Leona Buss, Spring Valley. Leona is a member of a club of Spring Valley, from which the state champion comes. Each member grew one-tenth acre of tomatoes. Leona has canned 100 quarts and made a profit of more than $50.00.

3. Olaf Anderson, Fergus Falls. Olaf comes from a community which is making garden work a very important part of their schools. Seventy-five young folks have grown gardens and learned how to can their products for winter use.

4. Freda Maurer, Mora. Freda is a member of Kanabec County Boys' and Girls' Club, which in 1916 had 200 hustling members. Club members here grew large gardens, 50x150 feet.

5. Homer Kelly, Gladstone. Homer should be classed as one of the most useful citizens of Ramsey County. This fourteen-year-old boy has made nearly $200 by his own efforts, this year, by his garden work.

6. Harold Darr, Minneapolis. Two hundred and sixty Minneapolis boys and girls were this year organized into clubs for growing home gardens in connection with school. Harold was one of the record makers, growing and selling $130 worth of garden products.

7. Elsie McNall, Sleepy Eye. Elsie represents a club at

Boys' Garden Club at St. Peter, Minn., winner first place, 1916, in southern district.

Sleepy Eye which has grown and canned 600 quarts of vegetables in both glass and tin. Prof. Fudge in his report of her work, says that Elsie is just as expert in canning in tin cans as he is.

8. Milton Johnson, Cokato. Milton Johnson represents the garden club at Cokato, where they have been growing some splendid gardens, and learning how to can their products as a market proposition.

9. Elsie Haines, Rush City. Elsie has been a county winner in Chisago County for two years and has made a splendid record in her garden.

10. Martha Palubicki, Perham. Martha comes from the Garden and Canning Club of Perham, Ottertail County, which has made one of the best records of the state this year.

I believe that in these young folks the Minnesota Horticultural Society is getting a group of members of which it may well

be proud. They represent clubs with a membership of nearly 700 boys and girls, and will bring some of the splendid things this society is doing to their communities.

The Potato Contest.

Another project which I believe this society is especially interested in is the potato contest. Nearly 1,200 boys and girls were enrolled in this contest the past year, representing 200 clubs. Each member of the potato club must grow at least one-eighth of an acre of one of the three standard types of potatoes, Rural New Yorker, Green Mountain, and Early Ohio. Records must be kept of all operations and a story, "How I Grew My Crop of Potatoes," must be sent in at the close of the contest. Each member must also exhibit a peck of his or her best potatoes at a general meeting of some kind. This week, at Bemidji, I believe we have the largest potato exhibit ever held in the state, when 300 boys and girls are showing their best peck of potatoes.

Elsie McNall, Sleepy Eye, one of the girls receiving membership in this society for good work.

In 1915, Oscar Larson, who grew 605 2-3 bushels on his acre, made a national record. The splendid results in standardizing leading varieties, in demonstrating better methods of cultivation, seed selection and increased production can hardly be comprehended.

The main object, however, of the boys' and girls' work is to interest the boys and girls themselves in farm life, and to show them the wonderful possibilities and opportunities which are open to the worker of the soil.

Lessons in leadership, in co-operative effort, in thrift and economy and in better methods of cultivation are all important, but the boys and girls themselves are the most important. Let us make them our partners by giving them a share of their own, whether it be an acre of corn, a calf, a pig, a potato plat, a garden

or a strawberry patch. Let us work *with* them instead of *for* them, and we shall find a lot of "Back to the Farm Movement" unnecessary.

The encouragement of this work by this association has done much to make it a success this year, and I hope you feel that you can help interest the young folks again for the coming year.

Mr. Baldwin: This matter has been emphasized a good deal in many places and in our town as well. Being a market gardener, and being very much interested in the boys and girls everywhere, I feel that the older men have a work to do to prepare the way. I have had boys come to me, wanting to put in vegetables, onions and other things, asking my advice relative to these things. Some of the extension men and the school teachers have come to me and wanted to know how about putting the boys to work. You know the average vacant lot in our towns and villages is covered with quack grass and things have run wild and they have allowed all manner of weeds to grow up, and it is the most discouraging business in the world to get boys to work on such pieces of ground. I said to them, if you want to encourage the boys to do work don't give them the worst kind of ground to start with. If we get busy and get these lots ready the year before, or get the boys to raise potatoes or something coarse so we will next year have the ground in shape to raise onions and beets, something like that, they will work them with some degree of pleasure. Let us give the boys and girls a chance, a reasonable chance, and they will love the work. If you don't give them a half a chance they will despise it as long as they live. (Applause.)

Mr. Philips: I was asked a question today, and I think I will correct the answer I gave. A newspaper reporter asked me (I was coming into the hall here) what was the greatest thing of the greatest benefit to the state of Minnesota that the Horticultural Society has ever done. I studied a little while, and I told her I believed the reinstatement of Mr. Gideon, after a division arose between Mr. Gideon and the society, taking him back into the society with opens arms and getting him to throw his whole work into propagating the Wealthy, was the greatest thing the society ever did. I don't know but what I ought to change it now and say that it is the encouraging of these boys and girls. (Applause.) There isn't a man or woman in this city or in the world but would rather see that young man wearing that badge for doing something than to see a dozen of those smart Alecs around town smoking cirgarettes. (Applause.)

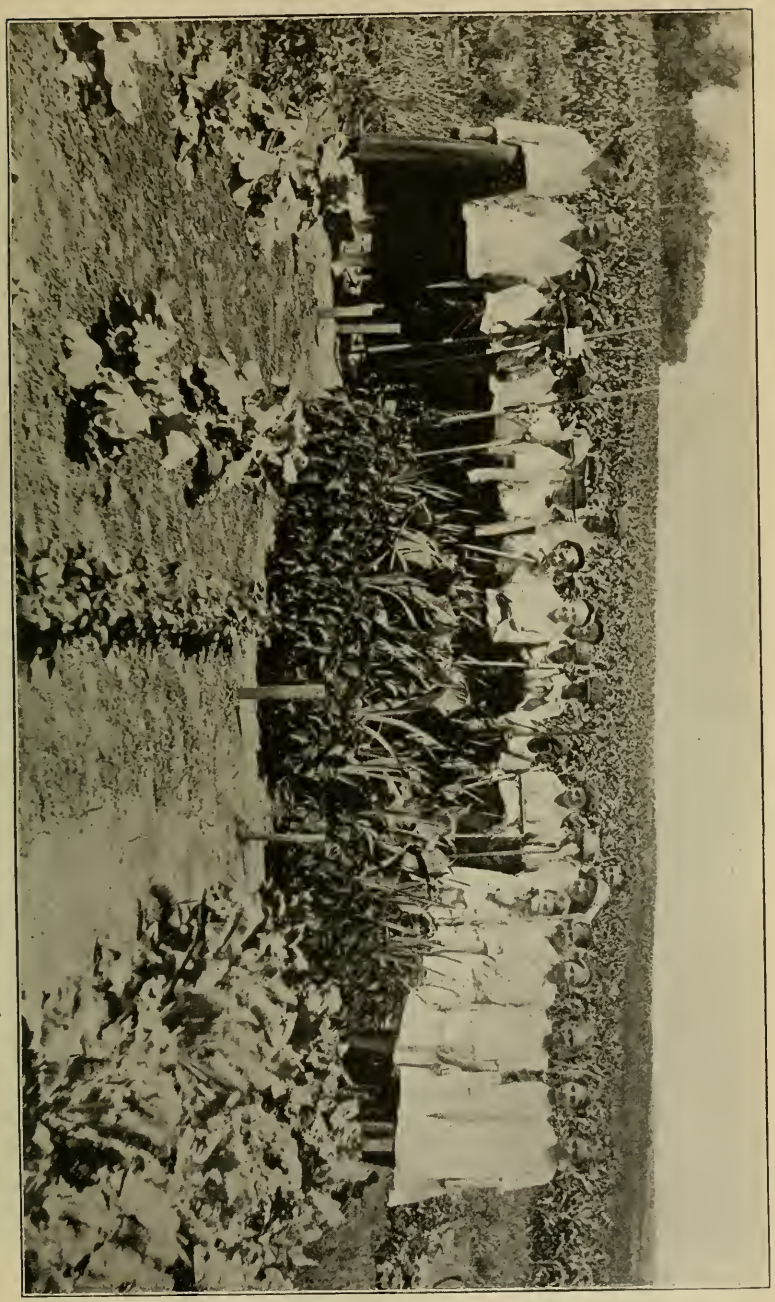
It has been a part of my life work to encourage the boys to do something useful. A young man asked me: "You recommend every boy to go to an agricultural school after he graduates?" I said: "Yes." He said: "I will have to teach and earn some money, and would you advise me to take the money and spend it in an agricultural school?" I said: "I don't care whether you are going to be a doctor or lawyer or even a nurseryman (laugh-

ter), it is worth your while to get these lessons in agriculture." That young man taught and went to school, and when they needed a man at Washington to judge grain he was sent down for that purpose as the best student at the agricultural school. Next year they sent for a man to go to Nebraska to take charge of the horticultural department, and they sent him to Nebraska. They discovered at Wisconsin later on that they needed him there, and they brought him back at $2,000 a year, and now he is professor of agriculture, and superintendent of agriculture in the state of Wisconsin. That is what one boy gained by being encouraged. Give the boys and girls a chance. (Applause.)

Mr. Claussen: I had intended to go away this morning, but I was persuaded to stay, and I might say I would not have missed this for anything. I have often thought of how we could take care of our boys and girls—I have some of my own. Sometimes my voice fails me when I think of the boys and girls in this country, how they get ruined. I have four boys myself. Even if I am old—I am not so very old—I tried to form a club for these four boys for the last two or three years, went in company with them. They have been growing some vegetables. I was very much interested in the everbearing strawberries, and we have divided that up, and I turned the horses and plows and so forth over to them. I don't want to take up the time, but my heart was touched when I saw these young people up here and heard them so much interested to stay away from the circus and the moving pictures and more taken up with what is of more use for the future. (Applause.)

Mr. C. L. Smith: I have been interested in this club work quite a number of years. I am employed by a railroad company, and my instructions were to do anything I could to improve the condition of the farmers, and I soon found out that the best way to reach the average farmer was through the boys and the girls in the public schools. I have to make a report every year in regard to what results I have gotten with the money that I have expended, and during the last five years a summary of those reports shows that we have got from twenty-five to fifty per cent. larger results from the money expended in the boys' and girls' club work than we have with the old fellows. (Applause.) Last year, 1915,—I haven't had time yet to make my report for 1916—but for 1915 we distributed seed corn to four thousand different people, twenty-two hundred of them were boys and girls in the corn clubs, and in every single instance the reports from the boys showed that they had raised twice as much corn per acre as dad had. (Applause.)

I was amused in reading a report in the Minneapolis Tribune that someone raised 135 bushels of corn to the acre. Why, we had a little boy at Walla Walla, Washington, that raised 149½ bushels of corn to the acre. (Applause.) Among our twenty-two hundred boys we had over five hundred that raised over a 100 bushels of corn to the acre. I say that from the summary of the reports



The Pipestone Garden and Canning Club.

it shows we have twenty-five to fifty per cent. better returns for each dollar in money spent from the boys and girls than of the older people; we have the reports that they bring in like Mr. Erickson showed here. Those boys and girls by those reports show that they have followed the instructions better than the older people have. They make better reports. More than that, those boys and girls, a larger percentage of those receiving the seed make reports. Therefore I am here to say that you members of the Horticultural Society in working for the betterment of the world in which you live, you will find you get larger returns for time and money spent on boys and girls than you will on the old ones. That is true of boys and girls as well as of dogs, that is, it is hard to teach an old dog new tricks. (Applause.)

Mr. Erickson: I want to call your attention to these reports of the boys and girls. You notice that they are taught to give credit to everything they do in the garden work. I want to emphasize one point, and I am sorry to have to make this statement. We have about 1,200 boys and girls in these clubs, and I have only referred to one phase of their work. It is true that the fathers and mothers, the parents, who ought to be the most interested in the boys and girls, are really the biggest problem. The boys who are the quitters are the ones whose fathers say: "You better not compete for that prize, you better give up." These fathers and mothers look at it from the standpoint of the prizes; the boys do not do that; they get into the game.

I could tell different stories of such happenings. One little fellow complains that he wants to finish up, but his father wants to cut his acre of corn and put it in the silo. This father did not realize what it meant to the little boy. Another father lets his binder go through the acre, doesn't want his boy to fool with it any longer. That is why boys and girls lose interest in their homes. Give the boys and girls a chance!

This shows how the boys and girls get interested. Laura has brought you a sample of her soil along to show you on what kind of soil she grew her tomatoes. If you would read her story, and the story of many others of the girls in print, you would think it the most interesting story you ever got hold of. I want to say that we appreciate what the association has done to encourage this work. (Applause.)

Mr. Kellogg: I sent a dollar today to a girl twelve years old at Oakwood for the second prize of ten ears of corn. She took the first prize at the county fair, which was worth about $12.00. I told her I would give her a dollar a year for the next ten years. We have heard a great deal of what the boys do; I want to hear about the girls. I am sorry that Philips and I haven't got more youngsters about the size that you want to put into the corn field. Philips may have some grandchildren that he can put into the corn field, and perhaps I have, but I am sorry we haven't got more of them.

Mr. C. L. Smith: I have got eighteen. How will that do? (Applause.)

Mr. Philips: I am the oldest of sixteen, but I didn't have the chances these boys and girls have had.

Mr. Harrison: There has been a vegetable overlooked. A few years ago a lady took her puny, sickly daughter to a doctor and asked him about her. The mother didn't exactly understand the prescription, but she thought he said: "Feed her carrots." When she went home she fed her daughter carrots, she boiled them and she baked them and fed them to her daughter. In a month she took her back to the doctor, and she was rosy and plump and full of strength. The mother said: "Your prescription worked first rate." He was rather dumbfounded, but quietly led her out and found out about it. He had given her some Latin term, and she had understood carrots; and that was the result.

This is a vegetable that has been overlooked. It is nutritious and can be raised in immense quantities, and the girls can raise them. You can raise a thousand bushels to the acre. They are very palatable and they bring good prices. Don't overlook it and add it to the assets of the girl. (Applause.)

The President: We have a splendid example of the wonderful work accomplished by the Minnesota Extension College, that is a division of the University Farm. These young people who have given addresses have demonstrated not only their ability, but that they have been educated to say things. Did you notice the ease with which these young people stood before this large audience and told their little stories? Did you notice the splendid language they used, far better than some of us older people that have not had their opportunity. Credit is due their parents to start with, and then it has been the work of our splendid Extension Division. There are thousands of young people throughout the state that are waiting for this opportunity; some of them have been given it. I presume the young people that have been before us today are only a fair sample of the hundreds of young people that are working along this line.

I had rather my boy or girl might be possessed of the fine spirit and the knowledge they have displayed along those lines than that they should own a quarter section of land free of charge and not be possessed of that spirit or of that knowledge. (Applause.)

VINE CROPS SELDOM CROSS.—Many gardeners are afraid to plant muskmelons and cucumbers together for fear of their crossing. These two crops never cross, and if poor quality melons are obtained, this condition must be ascribed to improper cultural conditions, poor seed, or the attacks of disease or insects. Varieties of cucumbers or of muskmelons cross readily among themselves, but never with each other. Neither do either of these crops cross with watermelons, squash or pumpkins. Winter squash and pumpkins will not cross, but summer squash and pumpkins may cross.—"Wis. Horticulture."

How I Grew My Garden.

LAURA HINTZE, SPRING VALLEY, FILLMORE COUNTY.

(Prize Winner in Boys' and Girls' Garden and Canning Club Contest.)

The vegetables I chose to raise this year were tomatoes. The plat on which they were raised contained one-tenth of an acre, of which the subsoil is sandy and the top is black soil.

Miss Laura Hintze, State champion Minnesota Garden and Canning Clubs in 1916.

The very first thing I did was to have the plat fenced, then plowed, disked twice and harrowed twice.

On May 19th I received my plants. I planted them the next day. The plants were set four feet apart each way. When planting, they were set a little deeper than in previous bed. Shortly afterward it rained. Out of two hundred plants, only nine did not grow.

They were only hoed twice and cultivated twice. I did not prune the plants at all, as the tomatoes seemed to ripen evenly and not all at once. I staked only a few, as the season was dry. If the season were wet, it would be better to stake them to keep them off the ground; for if left it causes them to rot.

I picked the first ripe tomatoes July 28th. There was a ready sale for all I had in our own town. I sold them at ten down to one cent per pound. To prepare them for market, I wiped them with a dry cloth and packed them with the bottom end up. When it rained, the ripest tomatoes cracked; these were kept for home use.

I had fresh vegetables eight weeks. The total number of pounds I raised was 2,679, bringing me a net profit of $58.24. I am satisfied with this year's work, and intend to try it again next year.

How I Grew My Garden.

CARL POTTHOFF, JORDAN, SCOTT COUNTY.

(Prize Winner in Boys' and Girls' Garden and Canning Club Contest.)

My garden was a little less than one-tenth of an acre in size. I had it plowed with my father's garden; then I prepared the seed-bed with a hoe and rake. I planted tomatoes, popcorn, carrots, radishes, beets, cucumbers and cabbage. The reason for this variety was that we needed them for home use.

I had a little trouble with striped insects eating my young cucumber plants, so I bought some insect powder and practically exterminated them. I had my garden clean for the greater part of the year, but later some weeds grew in various parts of it, although I managed to keep them away fairly well.

Carl Potthoff, Jordan, champion Minnesota garden and canning boy in 1916.

The thing I most disliked was getting customers who would buy my vegetables. I sold some, however, the receipts amounted to $3.50 from my garden and about $10 from my father's garden. I received a good commission on what I sold for my father. There are two gardeners here who sell vegetables daily every summer, so I found it hard to get rid of some things. I found that radishes, sweet corn, peas and carrots sold best. Tomatoes, of which I had a lot, sold badly, 50 cents a bushel for a while, but later I could not sell them at all, so I canned them.

The meetings of the Canning Club were held every week, and we canned outside. At first we canned in a home-made canner, but later in a new "hot-water bath" canner. I canned 83 quarts, both in tins and in glass jars. Tomatoes, apples, carrots and beets were the vegetables canned most, though many other

things were canned. Fifty quarts of things I canned were from my garden. At the County Fair there was a boys' and girls' division. I entered my vegetables there and took $3.50 in prizes.

This year I was often ready to give up my work, but I stuck and am in it for another year. The club members are intending to make it a bigger success next year; we will try to get vegetables to the state fair. This year I did not become a millionaire from my garden. I did not break any records. But I did make more money than if I had not entered the contest, and I did gain a lot of experience in growing and marketing vegetables. I am going to make a bigger success next year.

Field Mice.

BY O. W. MOORE, SPRING VALLEY (SOUTHERN MINNESOTA HORTICULTURAL SOCIETY).

In the spring of 1915 Prof. Hendricks, of the Agricultural Department of the Spring Valley School, came to me and asked me to go into the country with him to inspect an apple orchard. On arriving at the orchard I found one of the worst cases of girdling that I have ever met in all of my horticultural experience. The orchard stood on a stony ridge, the north end of the ridge sloping down to nearly level land of a few acres. This part of the orchard being rich land had put up a heavy growth of blue grass during the summer of 1914 which had not been mowed. This made an ideal home for mice during the winter. The trees were from two to three inches in diameter and were girdled from two to twelve inches in length—and the mice did not skip a tree. I did not count them, but I should judge that there were some three or four hundred of those trees. Mr. Hendricks asked me if I could suggest a remedy to save those trees. I said to him that if I had known of the trouble two or three weeks sooner that they could have been bridged, but it is too late now as you can see that the trees are showing green leaves and blossom buds and there were no dormant scions to work with. I then said to him that there is one remedy left. It is a remedy that has worked for me and I do not know why it will not work here. If the owner of these trees will go and buy six inch and eight inch lumber and saw it into lengths that will cover the wounds of these trees and nail them together and put these boxes on the trees so that the trees will stand in the center of these boxes and then fill these boxes with fine dirt and wet the dirt good, a large portion of these trees can be saved. The owner of the trees followed my advice and Mr. Hendricks reported to me last fall that ninety per cent. of these trees were doing well. Those boxes are not only a present help, but they are a preventive against mice in and for the future.

Horticulture at the Minnesota State Fair, 1917.

A. W. LATHAM, SECY.

The Horticultural Building was again entirely occupied, as it has been for a number of years now, with the horticultural exhibit, including under this title fruits, vegetables and flowers. This is a very large building, approximately 200 feet long by 125 feet wide. In the center of this building is an ornamental fountain some twenty-five feet in diameter. South of this fountain is located the flower exhibit, consisting of displays of foliage plants by professional florists, occupying strips running lengthwise of this space. These groups of ornamental plants are placed upon the floor with an area of earth around them, neatly bordered by a low edging, separating them from the walks used by visitors. The spaces left around the outside of the building are used largely for cut flower exhibits, and these are maintained in large part by amateurs. In the center of this space is a considerable area used for decorative designs and decorated dining-room tables. All the departments of this flower exhibit were well filled at this fair. There was, I judge, an unusual display of cut flowers grown in the gardens of the exhibitors. Every variety in season at that time was certainly on exhibition, and if this were the only display at the State Fair it would well repay the visitor for the time and expense to have the opportunity of studying this infinite variety of flowers. Prof. LeRoy Cady, of University Farm, was in charge of this flower department.

The fruit department occupied the northwest quarter of the building. In general appearance it was very much as for two or three years past. The west wall gave a space for a long sloping exhibit of single layer boxes of apples, some 600, I should judge, making an almost startling display of the possibilities of apple growing in Minnesota. The north wall, on a similar slope, was occupied by full boxes of apples, and judging by what the writer heard and knows of this display it was pretty nearly on a par with similar displays in the best apple growing regions of the country. The floor space was occupied by six long fruit tables with graduated shelves on each side, furnishing accommodations for nine rows of fruit for each table. These were all well filled with the various exhibits of collections and single plates, in fact there were no vacancies or thin spaces on any of

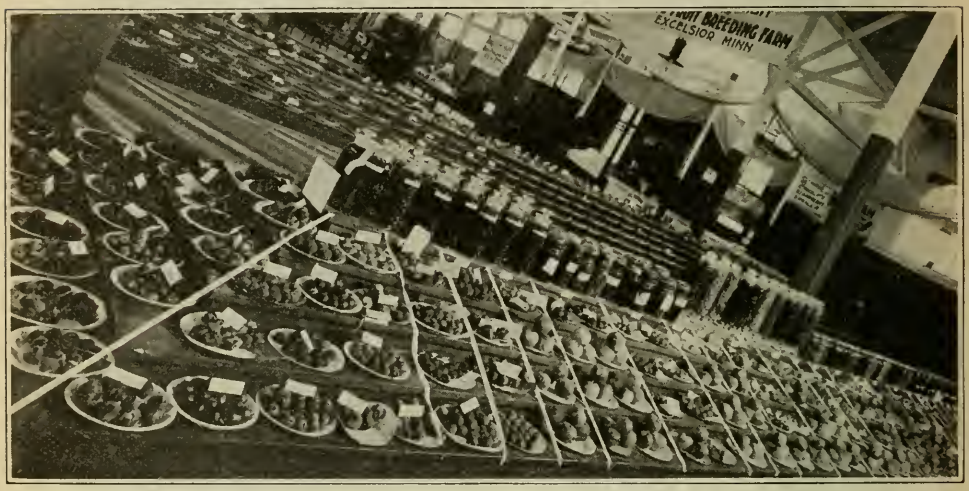
these tables. The apples shown were hardly up to the normal size or coloring on account of the lateness of the season; nevertheless the display was on the whole a most satisfactory and creditable one. The State Fruit-breeding Farm occupied two of these tables with the various new fruits, consisting largely of grapes and plums, originated at the Farm. Of these the most interesting were the new varieties of plums, No. 21 easily holding the center of attention. The writer was handed a detail statement of these various exhibits, but by some mysterious process it has disappeared so that the reader will be spared the statistical portion of this description.

The northeast quarter of the building was occupied by the vegetable exhibitors, excepting a space some forty feet square which was used by University Farm for demonstrations of the various practical arts which are being carried on and taught there. The sorting and packing of apples, spraying, pruning, etc., occupied this space. These demonstrations drew the attention of many of the visitors, and its usefulness was fully shown by the time given to it by those interested in these arts. The rest of this space was occupied by probably the best vegetable exhibit ever made at the State Fair, judging by what was said in regard to it by those who spoke to the writer about it. Two long rows of graduated shelves occupied the central space, from the north door of the building to the fountain, showing every conceivable variety of vegetables adapted to Minnesota's climate. The Market Growers' associations of Minneapolis and St. Paul put up the usual association displays in friendly rivalry. One of these displays is shown on the opposite page, that made by the Minneapolis Association. The first premium this year went to the St. Paul Association, of which exhibit we did not succeed in getting a picture. Minneapolis display looks good enough to have been worthy of first, and I judge there was not any large difference between them. Mr. P. B. Marien, of St. Paul, was in charge of this department.

Liberal premiums are being offered now-a-days for displays in the Horticultural Building. The division of fruits gives $1,800, the division of flowers $1,939.50, and vegetables $1,321.00,—in all $5,060.50. The writer has only one criticism on this building and that is not by any means against the management of the building, which in the hands of J. V. Bailey, assisted by Thos. Redpath, Supt., was most excellently planned

Exhibit of vegetables by Minneapolis Market Gardeners' Association, at Minnesota State Fair, 1917.

and operated. Of late years certain concessions have crept into this building, selling perfumery, fancy glass, pens, tops and some other things that on account of the way they are operated always draw a crowd. The excuse is that the concessions, as they are called, increase the revenue for the maintenance of the fair. This year we understand the amount received from this source was approximately $500.00. After setting up such a splendid building and spending over $5,000.00 in doing it, and this, by no means, covers the whole expense of this department, which in-



View across fruit tables at State Fair.

cluding interest on investment, depreciation, repairs, overhead expenses, etc., would easily increase this amount one-half—it seems poor policy to introduce so discordant an element to save one-fifteenth of the cost of the department. It would even have been better to have cut down the premiums offered in this department $500.00 and had a clean building. Don't do it again!

The Horticultural Society maintained an office near the north door during the fair, at which the secretary was in attendance a considerable portion of the time. A large number of members were met in this way, and the fraternal spirit of the society had opportunity for full manifestation. A considerable number of memberships were secured, and we trust the presence of the society in this semi-official way added somewhat to the interest of this splendid building. Nearly all of those we met there were from our own state. We had the pleasure, however, of spending two or three days during the week with Professors

Hansen of Brookings, South Dakota, and Waldron, of Fargo, North Dakota, both of whom are well known to our members. Other visitors from Iowa, Nebraska, Wisconsin and Manitoba spoke with us, but their names are not recalled.

In recalling the personnel of this exhibit, I am impressed with the great changes that have taken place in the list of names of those who put up the fruit exhibit at our state fairs. Of all the exhibitors who participated in the present fair only three had anything to do with the horticultural exhibit ten years ago, the names of these three being F. I. Harris, J. A. Howard and P. H. Perry. Going back to the exhibition of twenty years ago only one of the present exhibitors was making an exhibit at that time, Mr. J. A. Howard. The majority of those who have dropped out as exhibitors are no longer with us, but a few, some even of an earlier period, still remain, and while they are not exhibiting at the state fair serve with us at our meetings and in other ways.

Cold Storage Needed.—The high cost of living, which we all feel, could be lessened materially by the erection of municipal cold storage plants in all cities and towns of sufficient size.

The high cost of most articles is the result of speculation. Fruit that costs a dollar a barrel will be held and four or five dollars asked. Eggs that cost from twenty cents up will be held for fifty cents at the season when eggs are not plentiful. The price in neither case is regulated by supply and demand, except the supply and demand of a few months of the year.

With a cold storage plant in every city and town it would be possible for many householders and many merchants to store their own fruit, their own eggs, their own potatoes, even their own butter and cream, for cream can be kept by cold storage. This would be a good thing for the producer, and it would be a good thing for the consumer. It would serve to stabilize the market, making fruit not the short season perishable product it now is, but something that could be kept over a term of months. The added time would increase the value of the fruit, and this would be to the advantage of the producer. On the other hand it would allow the consumer to buy at a time when the price was not prohibitive, with the result that he would buy more, would live better, and would spend no more money than now.

The great difference would be that a much larger percentage of the money spent by the consumer would go to the producer and a much smaller per cent. to the speculator than is now the case.—"The Fruitman & Gardener."

Crookston Trial Station in 1916.

T. M. McCALL, SUPT.

The season of 1916 was a normal growing season. Tree and bush fruits for the most part wintered well during the winter of 1915-1916, due quite largely to the heavy fall of snow. The small fruit and the fruit plots were flooded and remained wet quite late in the spring, owing to the great flow of water through the drainage ditches.

The raspberry seedlings and one strawberry are the only fruits received from the State Fruit-Breeding Farm that are in bearing at the present time. The new plums and grapes have all been planted during the past three years and have borne only a few scattering fruits.

The following chart shows the results to date of the Minnesota seedling raspberries:

	Number planted.	Per cent stand in 1916.	Yield 1916.	
Minn. No. 1—1913	50	25		Winter kills badly.
Minn. No. 2—1913	100	20	½ pt.	Kills badly with winter protection.
Minn. No. 3—1913	50	90	5 qts.	Good grower, hardy.
Minn. No. 4—1913	100	98	5 qts.	Very hardy.
Minn. No. 5—1913	30	94	4 qts.	" " vigorous grower.
Minn. No. 6—1913	100	30	1 qt.	Unprotected plants winter kill quite badly.
Minn. No. 7—1913	25	95	2 qts.	Vigorous grower.
Minn. No. 8—1914	28	85		Good growth.
Minn. No. 30—1916	5	30		Fair growth.
Minn. No. 31—1916	4	60		Fair growth.

The varieties that fruited ripened their fruit in the following order: No. 3, No. 5, No. 6, No. 7 and No. 4. The first picking was made from Minnesota No. 3 on July 20th. The first from No. 4 was on July 26th. Minnesota No. 5 gave the largest yield, followed by No. 3, each yielding twice as much as Minnesota No. 4. The Minnesota No. 4 produces the better market berry, the No. 3 is inclined to shell but is of good size and color. The Minnesota No. 5 is apparently a hybrid verging toward a purple cap and is only fair in quality. The Minnesota No. 7 and Minnesota No. 5 are both prolific plant makers.

Sixteen varieties of Minnesota seedling plums have been planted to date. These trees, the same as the standard varieties in the plum orchard, have not made satisfactory growth. The growth of the plums has been retarded each year by excessive

amounts of soil alkali. However, this plot was tile drained during the past fall, and it is hoped that the alkali factor will be removed.

The seedling grapes planted in 1913 have not fruited yet; of the eight varieties planted only four have survived. All of the varieties were severely injured, and some entirely killed by the early fall freeze of 1913 from injury from which some are just recovering. Vines of Minnesota No. 6, No. 7 and No. 8 have made good growth during the past season, while a specimen of No. 3 has made only fair growth. The grapes are given winter protection each year. The Campbell's Early, of the standard varieties, has made the best growth of vine, excelling the Beta in this respect, but to date neither variety has borne sufficient fruit for comparison of varieties.

Twelve different lots of Malinda apple seedlings were received the past season from the Fruit-Breeding Farm and planted with good results. Fifteen other lots of numbered apple seedlings were also planted. During the past six years eleven standard varieties of apples and nine varieties of crabs have been planted on the experimental farm, and from this planting the following results have been noted to date: Hibernal, Charlamoff and Duchess have made the best growth of the apples; Virginia, Transcendent, Florence and Whitney have made the best growth of the crab varieties. Virginia crab and Hibernal apple produce dependable trees for the upper Red River Valley. Young orchards need windbreak protection from the southwest, west and north. The hard storms of the past summer did considerable damage to many of the fruit trees.

In addition to the fruits on trial from the Fruit-Breeding Farm, standard hardy varieties of all small, bush, vine and tree fruits are being tested.

The outlook for the home fruit garden in the Red River Valley is bright. There are enough hardy sorts of fruits on the market to make a good variety to supply home demands if the fruits but receive intelligent care.

When to Plant Corn.—Corn should be planted early; just as soon as the soil is warm enough to induce germination and the danger of frosts is past, according to Farmers Guide. Where the land is plowed in the fall or during the winter it can be planted much earlier than if plowing is delayed until spring. It is not wise, however, to sow seed on a poorly prepared seed bed in order to secure early planting. Later planting preceded by good seed bed preparation is better. By having a good seed bed and by using tested seed, the corn planted late will stand a good chance of maturing before early frosts as well as that planted early on a poorly prepared seed bed.

The House Mother's Vegetable Garden.

MRS. E. W. D. HOLWAY, EXCELSIOR, MINN.

In these days we hear much of efficiency—we are taught that it is not enough just to live, but that we must make our lives count in the welfare of the world. Another word we are becoming used to is "conservation." We must not waste that which belongs to the future. These two words are suggestive in relation to gardening.

As in the progress of civilization we find, more and more, that forethought is necessary, that we cannot live only for this day, or even for this year, so in the details of gardening the work should be done with reference to coming needs as well as for present requirements.

I have had special charge of the vegetable and fruit gardens for the house for several years. As house-mother I consider the garden in connection with the serving of vegetables for my family. It has taken me a long time to get the needed amount of each thing, but now I feel that I have approximate measures for the needs of a family of five. We are only three for all the year, but the children come home, or others visit us; so I plan to be supplied, and find I can give away the portion not required at any time.

Instead of providing every fruit and vegetable for all times of the year, I plan for certain things in their season. I count by months, though the time of production varies from three weeks to six weeks.

Potatoes, beans, tomatoes and onions I must have for the whole year.

Then for main vegetables for the months, I have: first, salsify, which should be available in March. Next year I will have my bed shaped so that a cold frame nearly ten feet long, with half sash, can be placed over to thaw out the earth in time. For April I have *parsnips*—about the same amount as of salsify. Both beds must have a light covering in fall after first freezing, to prevent thawing in winter. The seed must be planted in April for these two things, so a place must be chosen which can be spaded two full spades deep in fall, with barnyard manure not too new in the lower portion. These beds should be left rough and uncovered.

When *asparagus* begins to push up its big green fingers about the first of May there is feasting in this house. This is the main

vegetable for about six weeks—until *Peas* are ready. Four varieties of peas take us well on into July.

If Champion of England *peas* and Early Bantam *corn* do not meet, I have a row of extra, or reserve, vegetables, *beets* and *carrots* in any case and, perhaps, a few *turnips* and *kohl rabi.* These are to be used if a change is desired, or if there are enough people at table to use an extra vegetable.

After corn, in September, I plan for *summer squash.* That is often used as a reserve too, earlier. October is to have *cauliflower* and November *winter squash.* There is still a reserve row, either the early one or the winter row of root vegetables. In December there are to be *beets* with butter or creamed, and if there are still good squashes, they run into the month.

January should have *rutabagas* and February *celeriac* and *carrots.* These we will not tire of if they are carried into March.

Then I plan pot herbs in the same way. There should be enough *cabbages* stored for March, and April should find *Siberian kale* starting to grow. That should be planted so a cold frame can be put over to thaw out early. About the last of June I think is the best time to plant Siberian kale for this latitude (45 degrees north). Before May 1, *dandelion* is ready. Dandelions are troublesome weeds, but I do not depend upon the volunteers, but plant seed of the broad leaved kind in April. I try to have *spinach* for all of June. The thinnings of beets are not wasted, and I plant some at intervals just for pot herbs. In July *Summer cabbage* begins and runs into August. It is well to have a reserve row of *mustard*—perhaps two plantings of a few feet—but *Swiss chard* planted last of June will give repeated cuttings, and if wished *New Zealand Spinach* gives cuttings after hard frost. These two will cover September and October easily. In November I use *celery* stewed or scalloped or in soup—and in December and January *cabbages.* I like to have *sauerkraut* for February for change and to avoid opening the vegetable cellar in severe weather.

For *salads* we have in March delicious celery, which was stored in the root cellar after it was cold enough—packed close on concrete floor with earth or sand to shut off air from front of roots. I sometimes need something before April is gone, and beet pickle or celerac sliced raw helps out. Perhaps a little blanched dandelion also.

About May 5 *radishes* may be expected from the cold frame planted the first week of April. This bed should be prepared in

fall like the pasnip and salsify bed. *Lettuce* comes soon after from cold frame—then from outside planting. I expect head lettuce for June and July. There are always reserve plantings of leaf lettuce and radishes into July, also curled *cress, sorrel, chives* and *horesradish. Cucumbers* and *sweet peppers* are ready for August. I plant lettuce for September the last of June and for October early in July. I thin these plantings instead of transplanting, as the weather is usually very trying. The October lettuce must be covered with a frame when frost comes—and kept aired—perhaps frame removed for a few days when weather becomes warmer. *Endive* for November needs a frame also. This is taken up and placed—roots on root cellar floor—or on flats with protection of earth or sand where needed. It should blanch well here.

For December there is Celery, and I plan to have *Witloof chicory* in January, (taken from outside in October or early November and trimmed and planted close in boxes,) or perhaps *celery cabbage* would be better.

For February, *beets*—probably best put up in sealed jars—but good uncooked ones are all right.

I plan to use *tomatoes* and *onions* each one day a week for extra vegetable, pot herb once or twice and *beans* once in place of meat.

My vegetable garden is 100x65 feet, including walks. Sweet herbs border one walk, and asparagus frames garden on three sides.

Poisoning of Trees By Illuminating Gas.—Illuminating gas is very poisonous to plants of all kinds. Trees in lawn and on the street parking are the principal sufferers. The gas from leaky pipes, in the ground, frequently causes the death of shade trees. The ground becomes more or less saturated with the gas. The symptoms of gas poisoning are not always easily distinguished from those of other troubles. Usually the first symptom of gas poisoning in the summer is that of the leaves turning yellow and dropping, the upper part of the tree showing the effects first. Dead limbs appear here and there and the roots and sapwood at the lower part of the tree to assume a bluish color, and have a peculiar, disagreeable odor.

As a rule, the odor of gas from a leaky pipe can be detected by making a hole several feet deep in the soil near the tree. If the leak is detected soon enough, the tree possibly may be saved by immediate repair of the leak and a thorough stirring up and airing of the soil. As a rule, however, poisoning has proceeded too far before the effects are noticeable, and as the injury occurs below the ground surface, no satisfactory remedies can be applied.—W. W. Robbins, Colo. Agri. College.

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So. Minneapolis.

October Meeting of Garden Flower Society.

Minneapolis Public Library, October 12th, 2:30 P. M. Program:

"Fall Covering," "Heeling In," "New Varieties Especially Successful," "Reports on Seeds."

Come and bring your friends.

General Directions for Bulb Planting.

The best soil for the bulb bed is that in which bulbs have never been grown. A light loam is the very best, to which rotted sods may be added to advantage. If the soil is heavy, it can be improved by adding sand.

The bed should be deeply spaded, at least a foot, at the same time digging in a fertilizer composed of three parts bone meal, one part wood ashes and one part Scotch soot—which you may not be able to procure now. Stable manure cannot be used unless it is very old and well rotted, and then it should be placed well below the bulbs, so it cannot come in contact with them. If possible, prepare the bed several weeks before planting so it may have time to settle.

When planting the bulbs it is well, if possible, to remove the earth to the depth at which the bulbs are to be planted, so that they will all be at a uniform depth and so bloom at the same time. Spread a half inch of fine sand over the surface before planting the bulbs, then carefully replace the soil so as not to knock any of them over. If this method of planting is not possible, the bulbs may be set in with a trowel or dibble, being careful that all bulbs of a kind are set at a uniform depth, and that a little sand is placed under each bulb to insure good drainage. One grower advises scattering pieces of moth balls in the soil of beds that are liable to attacks from mice or moles. After the ground is frozen two or three inches a light cover of leaves or litter may be put over the bed, the same to be removed before growth appears in the spring.

Hyacinths will do better in a sandy soil than in heavier soil, as they are grown in Holland in a soil that is nearly pure sand. They should be lifted each spring when the foliage has ripened, and the bulbs stored over summer in a dry, cool place. Planting should be done before heavy frosts, the bulbs being set not less than six inches apart and six inches deep, measuring to the bottom of the bulb where the largest bulbs are used. For second sized bulbs five inches will be right. Hyacinths should have a little heavier winter cover than other bulbs.

Tulips are subject to a disease if planted too often in the same soil; so as far as possible use virgin soil or renew the soil in old plantings. Planting should be finished in two or three weeks after the first hard frost. Never plant when the soil is sticky after rains. The early kinds should be planted five inches apart and five inches deep; late tulips require six inches each way, and as many in depth. It is always best to place sand under them, and if any manure is used have it at least six inches below them. The bone meal will always be found safer to use in the bulb beds.

The covering should be light, applied after the ground is frozen, and removed as soon as an inch of growth has appeared in the spring, but keep a little ready to use in case of late frosts following rain or snow, as water often collects in the unfolding leaves, and freezing will destroy the flower bud just as it appears at the surface of the soil. *Early tulips* need to be lifted after the foliage has been ripened and stored for the summer in a dry, airy place, but the later tulips may be left where planted to bloom the second and third time, and will increase if they like the environment. If the blooms decrease in number and size, they are calling for another location and should be lifted and stored until autumn and then planted in a different place. When cutting tulips at least two inches of the lower leaves should be left on the stem to nourish the bulb.

The blooms of *daffodils* or *narcissi* last much longer if grown in a little partial shade, but they can be grown in almost any soil or situation. No stable manure should be used but keep to the bone meal mixture as for hyacinths.

Planting should be done as soon as possible after the bulbs are received for, as a family, all daffodils dislike being out of the ground any length of time. The Poeticus, especially, must be planted early. These bulbs vary greatly in size. Plant the larger ones six to eight inches apart, the smaller four to five and cover them one and one-half times their own depth. In very light soils an extra inch of covering should be given. *Daffodils* should be lifted and divided every three years. If some kinds do not bloom well, lift the second year and change the situation and soil. In dividing, be careful not to break the base of the bulb, and separate only those offsets that are loosely attached to the mother bulb.

Plant all *bulbous irises* early in the fall. Crocuses should also be planted early, and should be covered to the depth of two inches, measuring to the bottom of the bulb. Do not try planting them in the lawn in our climate. They will do as well in the borders and about shrubbery.

Scillas will do well in shade and are planted deep in comparison with the size of the bulb. Plant them five inches deep in rich soil. They will increase faster if let go to seed.

Snowdrops, Chionodoxas, Camassias, and Grape Hyacinths should be covered three to four times their depth, and, if covered at all in winter, given a very light protection.

Try and work out a plan for continuous bloom in the bulb gardens this fall. It is entirely practicable to raise a succession of flowers over the bulbs if the right things are selected. Here is a plan followed by one of our members. The bed is first planted to Darwin tulips. Late in the fall tall poppy seeds are sown broadcast in this bed. After the tulips have finished blooming, an equally charming effect is maintained by the gorgeous poppies. Later, bachelor buttons, asters and scabiosas are transplanted into the bed to replace poppies, which are pulled up when through blooming. These prolong the bloom until time to sow the poppy seed again, when they, in turn, are removed, the bed given a top dressing of bone meal and wood ashes, well raked in, and the poppies sowed again. Your Darwin tulips are six inches beneath the surface. Select, then, plants whose roots will not penetrate to them.

Charming effects can be produced by planting low growing perennials in the bed after the bulbs have been put in. Meadow rue will give a lacey background for your tulips and will make that particular part of the garden beautiful throughout the season. Our beautiful native blue phlox, divaricata, blooms at the same time as the later tulips, and most wonderful garden pictures can be produced by planting it among your pale pink or yellow tulips. Arabis Alpina, or albida, will provide a lovely carpet of white under your early tulips, grape hyacinths or daffodils. Phlox sublata, forget-me-nots, alyssum, saxatile and perennial candytuft are all fine to use in the same way. This double planting will double the joy of your spring garden.

N. W. PEONY AND IRIS SOCIETY.

W. F. CHRISTMAN, Secretary.

3804 Fifth Avenue South, Minneapolis, Minn.

At this season of the year when peony planting time has arrived, the question of what varieties to plant with the assurance of satisfactory results being obtained arises.

We are giving below a list of something over one hundred varieties that embrace the cream of all those now in cultivation. True there are new ones being constantly added which we intend to supplement to our list when their value becomes better known. Many of the old favorites have been retained in the list as they are indispensable. Others have been given a place on account of the extreme earliness or lateness of the variety. We want comments from any of our members on any of the varieties listed as it is our intention to later publish a list of 100 or more varieties, giving a brief description of each variety that will be a guide to our members and give them a list of the very best peonies in cultivation. A similar list of possibly 50 or more iris will be printed in the same manner. Be free to make comments, as we desire to have a list that will meet the requirements of our members in various localities.

Adolphe Rosseau
Albert Crousse
Alsace Lorraine
Asa Gray
Aurora
Augustin d' Hour
Avalanche
Baroness Schroeder
Belisaire
Berloiz
Beranger
Boule de Neige
Chestine Gowdy
Claire Dubois
Couronne d'Or
Constant Devred
De Candolle
Delache
Dorchester
Duchess de Nemours
Edmond About
Edulis Superba
E. G. Hill
Elizabeth Barrett Browning
Elwood Please
Enchantresse
Eugenie Verdier
Eugene Verdier
Felix Crousse
Festiva
Festiva Maxima
Floral Treasure
Francis Shaylor
Francis Willard
Germain Bigot
Gigantea (Syn Lamartine)
Gismonda
Gloire de Charles Gombault
Gloire de Touraine
Georgiana Shaylor
Grandiflora (Richardsons)
Grandiflora Nivea Plena
Grover Cleveland
Humei Carnea
Jas. Kelway
Jeane d'Arc
Judge Berry
Juliette Dessert
Jubilee
Karl Rosenfield
Kelway's Queen
Kelway's Glorious
Lady Alexander Duff
Laverne
La France
Laura Dessert
La Perle
Le Cygne
La Lorraine
Livingstone
La Tendresse
La Rosiere
La Tulipe
La Fiancee
La Fayette
La Fee
Longfellow
Loveliness
Madame Auguste Dessert
Madam Bucquet
Madame Calot
Martha Bulloch
Madame de Verneville
Madame Emile Galle
Madame Jules Dessert
Madame Emile Lemoine
Marie Lemoine
Madame Forel
Marguerite Gaudichau
Madame Geissler
Madame Lemonier
Mary Woodbury Shaylor
Marcelle Dessert
Mary Brand
Marguerite Gerard
Mathilda de Rosenack
Milton Hill
Miss Salway
Marie Crousse
Mons Jules Elie
Mont Blanc
Mons Martin Cahuzac
Model de Perfection
Mons. Dupont
Mignon
Neptune
Octave Demay
Opal
President Roosevelt
Primavere
Phoebe Carey
Raoul Dessert
Reine Hortense
Rosa Bonheur
Richard Carvel
Sarah Bernhardt (Lemoine)
Solange
Solfatare
Standard Bearer
Therese
Tourangelle
Umbellata Rosea
Walter Faxon

SECRETARY'S CORNER

FAMOUS FRUITAGE.—"My Transcendent apple tree, 44 feet across the top, 6½ feet around the body, 47 years old, will have 20 bushels of apples or more and net me more than $40.00 in cash. Some of my Wealthy trees, 47 years old, will have fifteen bushels or more and net me nearly $25.00 each. These Wealthy trees are grown from scions of the original Wealthy tree and among the first ever grafted."—Rolla Stubbs, Bederwood, Lake Minnetonka.

THE 1917 APPLE CROP.—The monthly crop report of the U. S. Department of Agriculture gives the apple crop in the United States for this year at 51.5 per cent of a normal crop which is two per cent less than the average of the ten preceding years. The estimated crop for Minnesota, as it appears in this report, is 1,386,000 bushels for this year. We have no method, not even an approximate one, of verifying these figures, which I suppose is the average of reports from a number of individual observers in this state. It looks large to us.

REPLANTING THE ORCHARDS OF FRANCE.—The Horticultural Society of New York is calling attention in a circular just at hand to the great destruction of fruit trees in France, caused by the devastations of the war. In the devastated region, now being re-occupied, it is found necessary to entirely replant the orchards. The society referred to has undertaken the establishment of a fund to be devoted to that purpose, and is requesting other American horticultural societies to co-operate in this commendable purpose. Members of this society who desire to contribute to this fund can do so through this office or by communicating directly with the Secretary of the New York Society, addressing him at New York Botanical Gardens, Bronx Park, New York City. The name is George V. Nash.

ARE YOU STORING FRUIT FOR THE WINTER MEETING?—Perhaps your attention was not called to the premium list for the coming annual meeting, which was published in the September number of our monthly. Looking this over you will note a considerable increase in premiums offered for a number of articles, especially pecks, boxes and barrels of apples. A new prize is offered for collections of cans of fruits and vegetables, intending to stimulate work in this line, which is of such special importance this year. We anticipate a large display, but to secure it, of course, will need *your co-operation* as well as that of your friend and neighbor. It will be noted that the fifth one-hundred dollar prize for a seedling grown under a previous offer is to be awarded at this meeting. The usual prizes for seedling apples are being offered, although there is a slight change in the way of an increase for late keeping varieties and a corresponding decrease for early winter varieties. What are you doing to help on this exhibition, in which the society takes so large an interest?

PROGRAM OF THE ANNUAL MEETING.—Some work has been done already, and progress made, in preparing the program for the coming meeting. We are already assured of the attendance of four leading professors of horticulture in the West besides those of our own state, namely: Prof. J. C. Whitten, of Missouri; Prof. N. E. Hansen, of South Dakota; Prof. C. B. Waldron, of North Dakota; and Prof. R. W. Brodrick, of Manitoba. Most of these have been with us with much regularity for some years. Prof. Whitten will attend our meeting for the first time, and on this account special work has been prepared for him on the program. Conservation, top-working, spraying, vegetable gardening, flower culture—the latter to be represented by three societies—will receive special attention at this meeting. In fact almost every phase of every branch of horticulture will find some place on this comprehensive program. Of course you are planning to be in attendance. Members will be accommodated at special prices at the West Hotel, and every facility offered for making the gathering a convenient, comfortable and a most enjoyable occasion. *Plan your winter vacation* in Minneapolis the first week in December.

From a photo taken at Summer Meeting, 1900.

UPPER ROW—E. W. Randall, St. Paul; J. R. Cummings, Minneapolis; E. R. Pond, Bloomington; H. M. Lyman, deceased; Col. W. M. Liggett, deceased; J. G. Bass, deceased; L. Hoyt, deceased; John Cooper, deceased.
MIDDLE ROW—Wyman Elliot, deceased; J. T. Grimes, deceased; W. W. Pendergast, deceased; William Somerville, deceased; Jas. S. Harris, deceased; William Mackintosh, deceased; D. F. Aikin, deceased.
LOWER ROW—Prof. W. M. Hays; A. W. Latham, Minneapolis; R. H. L. Jewett, deceased; Clarence Wedge, Albert Lea; S. D. Hillman, deceased; J. M. Underwood, Lake City; H. H. Heins, Olivia.

☞ Portraits of most of those whose names appear in the addresses published herewith are to be found in some one or more of the accompanying engravings.

THE MINNESOTA HORTICULTURIST

Vol. 45 NOVEMBER, 1917 No. 11

SEMI-CENTENNIAL ANNIVERSARY

OF MINNESOTA STATE HORTICULTURAL SOCIETY

HELD AT MINNEAPOLIS, DECEMBER 7, 1916

Invocation by Rev. C. S. Harrison.

DELIVERED AT THE OPENING SESSION OF THE FIFTIETH ANNUAL MEETING OF THIS SOCIETY.

O God, out of the great Unknown, out of the vastness and the mystery of Eternity, out of the glory and splendor of the Universe, Thou dost come to us in the person of Father, saying, ye are gods and all of you are children of the Most High. Thou hast given us the shield of Thy salvation, Thy right hand hath holden us, Thy gentleness hath made us great. Thou hast graven us on the palms of Thy hands; Thou dost hold us dear as the apple of Thine eye; Thou hast shut us in with the walls of salvation and enclosed us with the gates of praise. Thou dost rejoice over us with singing, and under our burdens and in our weariness Thou dost often lull us to sweet repose with the lullabies of love. And so as Thou hast revealed Thyself in these tender and intimate relations, we have confidence to come to Thee and boldness to approach Thy throne of grace.

And now, Oh God, we thank Thee for this half century with which Thou hast blessed this gathering, this society, and when from the present we look back upon the past and see the great strides which have been made we rejoice with thanksgiving and with delight. Oh God, what noble men Thou hast given us, and how Thou hast enabled them to conquer all the adverse forces and brought them down to the splendid achievements of today! And from this vantage-ground we look confidently into the future and think of greater things to be accomplished, and with the assistance which Thou hast given us thus far we are assured that in the future we can lean upon the everlasting arms, and that Thou wilt take us into the very holy of

holies of nature and reveal further those secrets which have been such a blessing and benediction to this great commonwealth.

We thank Thee, Our Father, that Thou hast enabled many of us to realize Thy presence and Thy guidance, for the secret of the Lord is with them that fear Him, and He will show them his covenant. And now, wilt Thou enlarge the scope of our efforts, may we not be content to linger earthward, but may we mount up sometimes on wings as of eagles and enter the high altitudes of God where we look down upon the littleness of mere material things and rejoice that in places where feet of angels do not go Thou dost go with us, that we may be co-workers with Thee to make this a more beautiful and fruitful earth. Some of us, Oh God, are growing old and soon the places which now know us will know us no more forever, and when we shall lie with hands folded and eyes closed in death and our friends look upon us, may they not view the countenance of those who have been worsted in life's great battle, those who have wasted probation, but may they look upon the faces of those who have fought the good fight and kept the faith and finished the course.

We ask all these favors through Christ, our Redeemer. Amen.

Remarks of J. M. Underwood.

PRESIDING AT THE SEMI-CENTENNIAL ANNIVERSARY SESSION OF THE SOCIETY, HELD AT WEST HOTEL IN MINNEAPOLIS, DECEMBER 7, 1916.

In accepting the chairmanship of this meeting, I understand it to be in recognition of my early membership in this society. I assure you that I deem it an honor and pleasure to look in the faces of this large and splendid audience.

Fifty years ago in the city of Rochester this society was born. There were twelve godfathers, or charter members, and we have the honor today to have with us the only living charter member, Mr. C. L. Smith, who will appear on this program.

Very dear to our hearts are the memories of those who organized this society, such men as Elliot, Stevens, Harris, Grimes, Jewell, and other charter members. They were characters whom we should study and from them learn the value of high ideals and steadfastness of purpose.

When we first came to Minnesota all the apple trees had been killed except the crab and a few of Talman Sweets and Russetts. Dr. Jewell undertook to solve the question of how to grow apples in Minnesota. He enlisted me in the work more than fifty years ago, and I have been everlastingly at it ever since.

I say to you that the Minnesota State Horticultural Society has been the greatest factor in helping me to succeed. Every one in the Northwest that has an interest in horticulture must recognize the value of this society. We are just on the crest of the wave of success. Let us go on and enlarge our scope of usefulness, get a home to live in and live forever.

Historical Sketch of Minnesota State Horticultural Society

A. W. LATHAM, SECY.

What I am to say at this time is somewhat in the nature of a historical sketch of the society, avoiding as far as possible all those subjects that will be taken up later by other members.

This society was organized at Rochester, in this state, October 4, 1866. Of the charter members as then recorded none are now living, the last one to pass being Wyman Elliot, with whose name and personality of course you are all familiar. There are two others, yet alive, who claim to have been present at that first meeting, whose names, however, are not in the list of charter members, Mr. O. F. Brand, now residing in California, and Mr. C. L. Smith, a resident of Oregon.

Col. D. A. Robertson, a prominent citizen of St. Paul, was the first president of the society. While his name appears later in the reports of some of the meetings, he was not long actively connected with the association.

The second meeting was held also in Rochester, October 4, 1867, one year later. The records show only ten names as present at that meeting. Mr. A. W. McKinstry, a newspaper editor of Faribault, appears as president for that one year. Mr. McKinstry died a year or two since, at an advanced age, having retained his connection with The Faribault Republican almost up to the day of his death. He was always a loyal supporter of the society, though only for a short time prominent in its counsels.

There is a measure of uncertainty about the history of the first few years of the society as it was not until several years after its organization that arrangements were made to gather the fragmentary records and put them in shape for preservation, which was done very carefully by John S. Harris, of LaCrescent, who will be spoken of later by others. I think that this was a labor of love on Mr. Harris' part, who was always an ardent worker in the society and continually serving in some practical way up to the very time of his death.

In 1868, September of that year, the third meeting was held, in Minneapolis, the membership roll showing forty-two names. The name of Peter M. Gideon appears here for the first time, with such other names as C. M. Loring, P. A. Jewell, J. T. Grimes, John H. Stevens, O. M. Lord, and many other names familiar in Minnesota horticulture. Indeed the roll for that year

included almost all of those who are termed the "veterans of the Horticultural Society." Mr. Chas. Hoag, of Minneapolis, was chosen president. I remember him as a very genial man, with liberal ideas, full of humor and altogether a wholesome person to be with.

The fourth meeting was held at St. Paul in January, 1869, occupying rooms in the basement of the Old Capitol. It was the first meeting which I attended, and all of the setting of that meeting, and the people who were there, appear to me as a clearly painted picture. I can hear the voices of those earnest men and see their faces as they sit, few in number, about the room. The records show forty-two names for that year, though no such number were present at the meeting. I had the honor of serving this meeting as secretary pro tem, my first official service for the society. I remember Mr. Wyman Elliot as present, and I recall that he moved to recommend the Soulard crab for general cultivation. Those who know this fruit these later days will appreciate the significance of such a recommendation. At Mr. Elliot's suggestion a first list of apples for planting in the state was prepared. I recall also that Amasa Stewart, a prominent early member of the society and nurseryman, residing then at St. Peter, introduced to the notice of the meeting the Stewart seedling crab, which afterwards was considerably planted though now not well known amongst the fruit growers.

The next meeting was held October 2d, the same year, at Rochester. John S. Harris, spoken of previously, was at that time first elected president. He served the society as president three years in succession, and then later in 1891 for two years more, making five years in which he occupied the presidency. There were no prepared programs in these earlier meetings, and nearly everything was by impromptu discussion. This, however, did not detract from the interest of the meetings, which were always of an intense character.

The next meeting was held in 1870 again at St. Paul.

The next meeting, that of 1871, was held at Faribault the third week in January, and from then on for a great many years the meetings were held at that mid-winter season. I recall at this meeting especially Mr. A. W. Sias, living at Rochester, very prominent in our counsels from that time on, and until he left the state many years later. He passed away a few years ago at his home in Florida.

In 1872 the meeting was held again in Minneapolis, R. J. Mendenhall in the chair. At this meeting Mr. John S. Harris

was elected secretary, holding this office also in 1873. The minutes note that I spoke in favor of the Red Astrachan and Sops of Wine apples, and that some one referred to the Golden Russett as never having killed down. We have certainly made some progress in pomology since those days.

In 1873 the meeting was held in St. Paul, I don't recall where, although I am quite sure that I attended nearly all of the meetings from the time I became a member in '69—but there were a good many of them, and my memory is somewhat at fault. Mr. Elliot was chairman of a committee that prepared a constitution which was adopted at this meeting. This constitution remained in force with slight modifications until at a meeting was held at Lake City in 1895, the constitution now in force was adopted with practical unanimity. This change in the constitution was considered necessary on account of an effort made the two previous years to capture the organization in the interest of some person or policy by bringing in a large number of memberships at $1.00 each, each such member having a vote just the same as those who had belonged to the association for years. The change in the constitution was a radical one, requiring three consecutive annual memberships to be entitled to vote, and placed the business of the society with the executive board. It made a great difference in the working of the organization, especially at its annual meetings, which were no longer occupied discussing the business of the society, but given up entirely to the consideration of horticultural topics.

In 1874 the meeting was held again in Minneapolis. A few new names appear on the list of members for that year. Reports from two local horticultural societies appear first in the report of this meeting. We had with us in those days Col. John H. Stevens, a very liberal minded person, full of geniality and courtesy, who often lead the way in offering votes of thanks to everybody who did anything for the society, often making them honorary life members, not taking it for granted as we do now, but putting it down in black and white. This is a very pleasing practice, which we have rather fallen away from these later busy days. At that meeting articles of incorporation for the society were adopted. The records of this meeting are especially interesting from the fact that mention of the Wealthy appears in them for the first time.

Truman M. Smith, of St. Paul, one of the charter members, was president of the society in 1874, as also the previous year.

He will surely be spoken of by others. I wish to note here that he held the office of presidency longer than any other person, in all eight years. Later he went to San Diego, California, and as a market gardener he labored zealously with his own hands, past the age of eighty being on the market every morning. At this advanced age he returned to visit his old friends in the Twin Cities, and I had the pleasure of meeting him at the State Fair in the fall of 1909. Coming on him unexpectedly I knew him and called him by name at a glance, though we had not met for twenty years. Within a few weeks after this he unexpectedly passed away. He was a grand and a noble worker in our society who in its pioneer days labored zealously for its advantage.

In 1875, Chas. Y. Lacy, then the Professor of Agriculture in the State University, embodying in himself, I recall, all the faculty of the Agricultural College, was elected secretary of the society, a position which he held the five years in which he continued with the University. He now at the age of 66 years resides at Long Beach, Cal. The first printing appropriation, as noted in our records, became available this year, $500. The membership roll shows sixty-one members.

In 1876 the society, now ten years of age, met at Winona. In the records of this year first mention is made of the library, although there was almost nothing in the library in 1881 when I became secretary.

In 1877 the meeting was held in Owatonna, and in 1878 in Rochester. I remember very well being at the Owatonna meeting with Mr. Elliot, though details of the meeting have passed from me.

In 1879 the meeting was held in Minneapolis, also in 1880 and 1881, occupying the City Hall, a building located in what is now Gateway Park. In 1880 U. S. Hollister, a seedsman, as I recall, in St. Paul, was elected secretary, holding the office two and one-half years, when he resigned and went west. I met him a good many years after at the St. Louis Exposition, a successful business man; we know nothing now as to his whereabouts. During these two years, 1879 and 1880, Mr. Jas T. Grimes, an honored citizen of Minneapolis, now gone home, occupied the chair as president.

In 1882 the meeting in Minneapolis was held in the Board of Trade rooms. I do not seem to recall any circumstances in regard to this. Upon the retirement of Mr. Hollister as secretary, in the middle of 1882, Mr. Oliver Gibbs, then residing at

Lake City, was appointed secretary, which place he held two and one-half years until his duties as superintendent of the exhibit of the state at the New Orleans Exposition made it impossible for him to continue longer in that office. During most of this period Mr. John S. Harris was president, and the meetings were held in Minneapolis at the College of Agriculture. I think this must mean the State University, as I do not recall attending at so early a day any meeting at what we now call the Farm School.

*Mr. Gibbs still survives in his Florida home, hopelessly blind, above eighty-four years of age. On his retirement, S. D. Hillman, who had been reporting for the society a number of years, was elected secretary and continued to hold that office for five years. During most of this period Mr. Wyman Elliot was president, having taken the office in 1886, the society being then twenty years old. In that year the meeting was held in Harrisons Hall, the third story of a building still standing on the corner of Washington and Nicollet, in this city. I must have been south that winter, as I have no recollection at all of the meeting.

The two succeeding years the meeting was held in Market Hall, Minneapolis, a building long since demolished, on the corner of First Street and Hennepin Avenue. The meetings these two years, as also the preceding year, were joint sessions with the Amber Cane Society, of which organization our Seth H. Kenney, one of the few veterans of our society still alive*, was the leading spirit. I recall one of these meetings at Market Hall where Peter M. Gideon reading an essay entitled, "Horticulture and the Fast Horse," was stopped in his reading by Mr. Grimes. As what transpired then does not appear in the records of the meeting I will speak as to my recollection of it. Mr. Gideon having read something which offended the religious sentiments of some of the members, Mr. James T. Grimes arose, saying, "I move you, Mr. President, that the further reading of this paper be dispensed with, that it be turned over to the secretary and boiled down ten parts to one and in that form published." In the meantime Mr. Gideon was slowly folding up his manuscript, and as he did so remarked, "No one will ever boil down any of my papers," and without further words on his part or on the part of others present he put his manuscript in his satchel, gathered up his coat and hat and left the

*Mr. Gibbs passed away since the above was written. Mr. Kenney has since passed away at the age of 81 years.

hall. This incident was the cause of a long estrangement between Mr. Gideon and the society. Mr. Gideon was in a sense for many years the storm center of the society. He was a man of very strong convictions, great determination of character and without regard to any personal sacrifice on his own part insisted on what he believed to be right, even though he might disagree radically and to his injury with his best friends. He will be spoken of by others and due credit be given him for his self-sacrificing labors in the development of Minnesota horticulture.

In 1890 the annual meeting was held in the Town Hall of Excelsior, Prof. Samuel B. Green being secretary that one year. The following year the meeting was held in Minneapolis in what is called now the Metropolitan Life Building, and at this meeting, it being Professor Green's earnest desire, I was made secretary. There was some exhibit of fruit made at this meeting and also had been in some previous years; not, however, in any such large way as has been done in the later years of the society. There were 118 paying members on the roll that year.

As this date brings us to the last twenty-five years of the life of the society, with which you are more familiar, I pass more rapidly over this period, during which I have served the society as its working officer. Mr. J. M. Underwood, one of our oldest members, as he first joined the society in 1870, occupied the position of president for seven years, from 1892 to 1898. Of these years '92 found us at Owatonna, '93 and '94 in the Lumber Exchange, in Minneapolis.

In 1894 the society adopted a radical change in the method of publishing its reports, issuing them thereafter as a monthly magazine, to be bound up at the close of the year for distribution in that form to the membership. This change undoubtedly had much to do with the rapid growth thereafter of the society, which for many years now has undoubtedly had the largest membership roll of any horticultural society in this country.

In 1895 we met at Lake City, and here we held our first society banquet. It was not till six years later we had another, since when it has been a regular feature of our annual gathering. The four years following we met in the County Commissioners' rooms at the Courthouse. At the last of these four meetings Mr. Gideon was with us for a short time on one occasion, a venerable figure with his long white hair. We saw him no more, as he soon after passed away.

The next three years, during which Prof. Pendergast was president, our sessions were held in the Plymouth Church, Minneapolis. The last of these years, 1903, Mr. Wedge was elected president, continuing in that office four years.

Commencing in 1904 our society held its sessions in the delightful auditorium of the Unitarian Church, in Minneapolis, making a fruit exhibit, of which we were always proud, in the basement. For eight years we continued our annual meetings under these most favorable auspices at the Unitarian Church. The last one of these years was saddened by the sudden passing of our beloved president, Prof. Samuel B. Green. We had lost previously our endeared ex-president, W. W. Pendergast, who passed away in 1903. His passing was anticipated, as he was a man of advanced years, but Professor Green was in the very prime of his life, and it seemed a cruel thing that one whose presence meant so much to us, one so helpful in a thousand ways, should have been thus suddenly snatched from us.

Mr. Thomas E. Cashman, our present president, was appointed to fill Professor Green's unexpired term, and was afterwards reelected, and has held the office until now, during six (now seven) consecutive years.

The list of names of those who have occupied the presidential chair in our association is one of which we may well be proud, representing as it does ability and virtue and the high standing of so many noble men. The Horticultural Society has certainly been most highly favored in its leadership.

The society has held summer meetings with almost unvarying regularity since the year 1883. Prior to that date the records show two or three summer meetings at irregular periods. With one or two exceptions these meetings were held at the University Farm. In 1884 and '85 the summer meeting was held in the Market Hall at Minneapolis, in '92 it was held at Lake City, in '94 as the guest of Mrs. Dorillus S. Morrison at her home, Villa Rosa, the place now occupied by the splendid Minneapolis Art Gallery. From then on all the summer meetings have been held at University Farm, a remarkable series of meetings, not only from the gatherings and exhibits with which in later years you are familiar, but notably from the phenomenally pleasant weather with which we have been uniformly favored, at least I am unable to recall any really stormy day for any of these meetings.

Many things of great importance have transpired during all these years. Our association has always been an optimistic one, and while there have been some dark days despondency has never been the prevailing note at any of its meetings.

Perhaps the most important feature of our work in recent years is the securing of the State Fruit-Breeding Farm from the State Legislature, which was brought about in 1908 during the presidency of Professor Green and largely by his efforts.

As a matter of history this was not the first fruit-breeding farm established by the state at the request of this society, as in 1878 the legislature purchased a tract of land adjoining Mr. Gideon's farm for fruit-breeding purposes and made him superintendent of it at a salary of $1,000, which position it was hoped he might retain through life. This, however, was lost later to the society and Mr. Gideon. Others will undoubtedly speak of this.

This very imperfect review has permitted mention of only a very few of the veteran workers of the society. Others will speak at greater length of these, and of many others whose names I have not mentioned. We cannot give too much praise to these veterans the fruits of whose labors we are now enjoying.

PETER M. GIDEON—originator of the Wealthy apple.

Heroes of Minnesota Horticulture.

CLARENCE WEDGE, ALBERT LEA.

The real hero is the child of adversity, the man of faith and patience, with a vision of great things beyond the sight of mortal eyes. Our heroes are our most precious inheritance—the jewels, the talismans, that have been passed down to us from generation to generation, that we might wear them next to our hearts to ward off the base insinuations of a vulgar world. God knows we have need of them, for he has filled his book with the finest examples, and the songs and stories of every race worthy the name echo their achievements: David fleeing from Saul and scorning to end his troubles by taking the life of the anointed of God; Elijah unafraid going to meet a hostile king and his four-hundred false prophets in the might of truth alone; Washington holding his ragged, starving troops together that he might wear out the forces of the invader—have peopled the imagination of thousands, giving them strength to meet the emergencies of life with courage, and keeping them true and faithful through long years of struggle and heart-wringing endeavor. And so the race of heroes never dies, and yesterday and today they live with us and may be found wherever there is a great task to do, a call to some high achievement.

The life of the pioneer has much in it to bring out the heroic in man. The single-handed struggle with the elements in the open prairies and trackless forests, the never-ceasing watch against a savage foe, the quest for plants and trees that will fit his soil and bring food and comfort to his family, are activities that bring into play the highest qualities of brain and heart. There is no eight-hour day for him, no regular routine with an assured pay day, no beaten path to success, but rather a great adventure with many keen disappointments, many hopes deferred. Grizzled, weather-beaten, custom-defying veterans were they. Never one of them too proud to fight but rather glorying in their unending conflicts with nature or men or measures that seemed to stand across their way.

It has been my good fortune to know many of the men of the heroic age of Minnesota horticulture. To know them in a comprehending way was to love them. Their spirits seemed always freshened by the prairie winds, their hearts warmed with the glow of a perpetual sacrifice. They were as a rule remarkably free from the degrading habits and the conventional vices of

the times. I have nowhere seen men who came nearer exemplifying the virtues of the "pure in heart." They were true prophets and forerunners of the better time, not so distant, let us hope, when a man may not with impunity assume vices that he denies to woman. As a people, we are beginning to throw off the burden of alcohol. Our early heroes were almost to a man as earnest in advocating this reform as they were in their work of spreading the gospel of fruits and flowers. I suppose that it is not too much to hope that in some distant happy day the average man may think it altogether beneath him to befog his mind and defile his person and the air about him with a filthy, ill smelling narcotic. These men of whom I write were as clean and wholesome in their habits as athletes contending for a prize. I remember that in one important meeting we took a census in this matter, and not a single bad habit was to be found among those present.

Almost none of these men were blessed with large resources to draw upon in carrying on their experimental work for the benefit of the public. What they accomplished was done with their own hands with the assistance of the members of their own household, and it is astonishing how much some of them accomplished out of their slender means. I have in special mind Father Harris, of La Crescent. I doubt if any governor of our state has done as much to elevate the home life of our people as he accomplished in his long and faithful service among us. He was simply indefatigable in teaching our people how they might surround their homes with the cheer and comfort of flowers and fruits. In horticultural meetings, at state and county fairs, and in editorial work, he seemed never to lose an opportunity to say or do something for the advancement of the home life of his beloved state. And he lived the life that he taught in his own little Eden among the bluffs of the Mississippi. His house, shaded by a fine old pine of his own planting, the orchard full of rare varieties gathered from every corner of the state, with the vineyard upon the hillside, formed as sweet a picture of a rural home as I ever remember of seeing. I sometimes hear people complain of their opportunities. Let this man shame them. With meager schooling, no capital, no genius but the love of his work, he left to his state a fortune, bequeathed to it day by day as he spent himself in untiring effort to establish a horticulture in the new north. We cannot all be Carnegies, but we can all be Harrises if we will.

One of the fine heroic figures that I wish I might have known better was Colonel Stevens, of this city. His spirit seemed fairly aglow with the fires of patriotism. Nothing was too good for Minnesota, and he was ever watching that nothing good slipped by unnoticed. He was not so far as I know, an experimenter, but rather a patron of the men who were doing such work, giving to them all the cheer and encouragement they so much needed. About a year before he died it was my pleasant duty to be one of a committee appointed by the society to visit him in his declining days, and I was proud of him. Not a word about ill health, but the light of an eternal life beaming from his cheerful eyes, as he eagerly questioned about the success of the meeting and the prospects of some of the new fruits that were then being distributed in the state. You cannot think of such a man as dead. There is a spiritual quality there that defies the arch enemy, an impregnable citadel behind the outward man that none but God may enter.

With all the patient, earnest endeavor of men in and out of our society, how incomplete would have been their efforts without the organizing work of Professor Green. Here was indeed a genius magnificently endowed and equipped for giving horticulture the standing in the state to which it was entitled. When I read that passage in the scriptures, "Rejoiceth as a strong man to run a race," I am reminded of the exuberance of life and spirits that seemed always to animate his person. His strong, resourceful grasp after the things necessary for carrying out his purposes for good have a remarkable likeness in the statesmanship of that great American who was so largely instrumental in lifting our country to a higher plane of political living. I think of them often as two of a kind. A natural executive, bold, aggressive, determined, and withal of as gentle a spirit as a child. That he should have been taken away from us in the prime of life and usefulness, with every avenue of opportunity opening to him, is one of the mysteries hid from mortal eyes. We will be thankful for the few years that he was given to us, and those of us whose privilege it was to live near him will treasure in memory every hour that we spent by his side.

To no one of those who have left us are we more indebted for the prosperity that our society now enjoys than to our former president, Wyman Elliot. In every enterprise, business or social, there must be some few who are in a special way responsible

for its success. For many years Mr. Elliot might properly be counted among the most useful of those who carried such a responsibility for this society. I remember that in one of the stressful times of its history, one of our prominent members in a passion of disapproval called him the czar of the horticultural society, but in the same breath he characterized his rule as a benevolent despotism. In no one that I have known was the horticultural instinct or passion more clearly developed, and in no one was it more purely a labor of love. How appropriate that he should have breathed his last earthly air out in the early morning dew of his cherished garden. A more lovable character filled with good works and kindly offices has not been counted among us. I do not commonly approve of funeral orations. They are but seldom appropriate or even truthful, but the tender appreciative words spoken when we gathered to pay our parting tribute to this good and true man are among the choicest things that I have heard or read.

No record of the heroic in Minnesota history would be complete without a mention of the originator of the Wealthy apple. The life of Peter Gideon in our state was one long struggle to establish apple growing in a new and inhospitable climate. Those who have not lived through the early days of this industry in Minnesota can hardly appreciate the courage that it took to continue experiments of this kind in the face of the universal doubt and disfavor of the public. I imagine that it may be easier for an inventor to carry on his work in the midst of discouraging surroundings. He may at least keep his troubles to himself, and he may commonly have a greater certainty of a successful outcome. But an orchardist has to wait so long for results, and his failures are always fully exposed to the derision of his neighbors. In an old scrap book of mine I find a clipping from one of his contributions to the St. Paul Press made in July, 1872, in which he says "I am happy to again announce to the public that the prospect is brightening, especially in the profusion of varieties of the apple that bid fair to succeed here." He then gives a "List of old esteemed varieties that stand here in succession of ripening." Among them I note many such kinds as the Northern Spy, Newton Pippin, Seek-no-further, and but two among them all that any one would now think of planting. Those having some knowledge of the varieties of apples in the north can easily guess the state of things in such an orchard within a few years.

And yet twenty-three years later, in 1895, when Professor Green and I visited him, he seemed as hopeful as ever, and when he died four years later, at the age of eighty-one years, he left a large number of seedlings that were distributed by our society. What a lesson we have here of courage and patient persistence.

I can see him now as with fine, erect figure, his snowy locks forming a kind of halo about his serene face, he came before the society for the last time. I think that it was altogether fitting that one who had forced the very elements to bow to him should after a period of alienation have received the capitulations of the society and graciously taken us back again into his favor.

As a near neighbor I had an interesting acquaintance with Mr. Dartt, of Owatonna. He was a much older man than I, and I think took no small pleasure in steering me safely along the path to success, in our chosen vocation. I remember his going over with me the first crude little catalogue that I sent out and saying encouraging things about it that were very creditable to his kind heart. Like a large share of the early experimenters he was an uncompromising prohibitionist, standing among the few in his city who began the good fight against the saloon that in these days is winning such signal victories.

It was my privilege to meet Mr. Sias, of Rochester, but once and that was for but a few moments on his house grounds, just after a tornado had swept over the city, demolishing his orchard and almost everything about the place. The wreckage had scarcely been cleared away, but I found him in his natural quaint and happy humor at work with his hoe out among the plants that the vicious storm had left him. I was glad that he was able to spend the closing years of his life in the sunny south, where a kinder climate seemed to harmonize better with the serene and happy spirit that always animated his person.

I would be glad to go on and speak of others into whose labors we have entered, and whose characters are as fragrant as the fruits and flowers that they have bequeathed to us. Some of them are with us yet, rounding out full years of blessed usefulness and enjoying the fruition of many of their cherished hopes. We would today do honor to them all, not only by these words of scanty appreciation, but by taking up anew the good work that they have begun and carrying it on with the same noble spirit of devotion and self sacrifice.

UPPER ROW—Frank Yahnke, deceased; S. D. Richardson, Winnebago; A. J. Philips, deceased; J. R. Cummings, Minneapolis,
LOWER ROW—Andrew Wilfert. Cleveland; E. R. Pond, Bloomington; Oliver Gibbs, Jr., deceased; Martin Penning, New Ulm; Dewain Cook, Jeffers; W. L. Taylor, Oregon.
From a photo taken at Annual Meeting, 1902

Personal Recollections.

*A. J. PHILIPS, WEST SALEM, WIS.

I once heard a speaker say that every man should be well born. That is my case, Ladies and Gentlemen. My parents were intelligent, God-fearing, Christian people of Welsh descent and of the Baptist persuasion, like our good old friend, Seth H. Kenney. From my good mother I inherited a good memory and a good constitution and from my father a love for fruits and flowers. This fortified me against bad habits and took me into the company of the best people on earth, the horticulturists.

An unforgetable scene was a visit from that grand Quaker gentleman, P. A. Jewell, at my home for two days. His good wife was with him. It was in the early seventies. He was the founder of the great nursery at Lake City, which still bears his name. I received from him the first real inspiration I had in apple growing. I recollect two visits I made to his grave at Lake City, where he rests in their beautiful cemetery.

In my further pursuit of knowledge in fruit raising I visited that good, honest old nurseryman, Uncle Wilcox, of Trempeauleau. I recollect his advice yet. He said, "You go with me next winter to Winona; the Minnesota State Horticultural Society meets there. Its members are well posted in apple growing, and you can learn much to your advantage." I went with him and became acquainted with a grand body of men. Truman M. Smith was president and C. Y. Lacy was their secretary. I also met E. B. Jordan, O. F. Brand, the veteran John S. Harris and many others, and to the best of my recollection I have attended thirty-four other of its meetings since that time. I recollect that I took much of the knowledge that I gained there to my own state, where I served for five years as their secretary.

The meeting that next fixed itself in my mind was at the old Market Building in the city of Minneapolis, when Peter M. Gideon was reinstated into the society, in 1883—Truman Smith was president and Oliver Gibbs was secretary. Gideon accepted their terms. He and his good wife were in an adjoining room. Good old Peter Peffer and myself, being from a sister state, were appointed to present them to the society. Peffer not being well used to English ordered me to introduce them. I knew the society wanted him back, and I introduced them the best I could. They were received by the members standing with open arms, and such another scene of hand shaking I never saw.

*Since deceased.

Among other things I said that Gideon had originated a great apple that had been planted from the shores of New England to the setting sun. Your society did a grand thing when you arranged for your students to perpetuate his memory in competing for prizes from his memorial fund. Our beloved departed Brother Wyman Elliot said a nice thing of Gideon when his picture was unveiled. He said he had his own religious belief, and if it was true—and none of us know to the contrary—his spirit may be in this room taking cognizance of our deliberations. After his death his son gave me a red peony which grew near his door at his old home. It now blooms in my yard, reminding me of the old man in his work every summer day.

In my recollections I cannot forget Edson Gaylord, and I hope he now is where fire blight don't disturb him. I slept with him five nights. He was so full of horticulture, it was hard to stop him. One morning at two o'clock I said: "For the Lord's sake, Gaylord, stop and let me go to sleep, as I want to take a 6:30 train." He said: "Don't be in a hurry, I want to tell you something about Mr. Patten."

I wish I could tell you what I recollect about Brother Dartt, but my time is going. Some years ago I did not see him at the meeting. They said he was sick, so I went home that way to see him. He could not speak aloud Saturday night, but Sunday morning his daughter said he was better and could talk. So I went into his room and he said: "Philips, I will not live long, and I want to ask you a question. You know I do not like preachers nor dogs, and I have picked you and Elliot to talk at my funeral, and I want to know if you can talk twenty minutes beside my coffin without saying anything mean about me." I said, "I will be glad to try." He said, "All right, my son will telegraph for you." I always enjoyed his company.

About twenty years ago your society sent him as a delegate to Cresco, Iowa. I was sent from Wisconsin. The audience the first forenoon was small, about twenty all told. In the afternoon he was to read a paper on his hobby, "girdling." On the way to dinner he said to me, "Philips, let us wake these people up and get some life into the meeting. When I read my paper this afternoon, you get up, act mad and pitch into me the best you can," and I did. I said a man that would talk such unmitigated nonsense ought to be arrested and sent home. I said if he came to Wisconsin and talked such stuff we would ride him on

a rail. It had the desired effect. The house was full after that. A stranger asked the secretary at the close who that fellow was who pitched into Dartt so. The secretary told him. "Well," he said, "I know Dartt was mad, and if I was in his place I would have that man arrested for abuse." The next morning he went again to the secretary, and said, "I was fooled, for I declare to goodness that Dartt and Philips went to the hotel arm in arm and slept together last night. That beats me."

I must speak of O. M. Lord. We all love to recollect him. Once I invited Prof. Bailey, of New York, to attend our Wisconsin meeting. He consented on condition that I invite Lord to come too, and at my request your society sent him. Lord consented to come if he could sleep with me, so he would not be left alone. We slept together five nights. When I met Bailey at the depot the first question he asked me was "Is Lord here?" I said, "Yes." He said, "I'm glad, for I want to see him so much." And it was a pleasure to me to hear those two men visit together.

I cannot stop without speaking of that staunch old Christian, Uncle Yahnke. We were together so much. I wore his shoes all one day in Iowa, and told the audience that it gave me an inspiration. I visited him two weeks before his death in the hospital. His parting words were, "Oh, Feeleps, I wish you could stay and talk to me. It would make me get well"—but it was not to be.

Next I must recollect Kellogg, of our state. He has visited me twenty or thirty times. You people always like to hear and see him. He is full of information and is always glad to tell it. I could talk of him for an hour. He once talked of his life to our students. I got up and said, "Boys, remember his advice, but do not try to imitate him. You can not do it. He courted his first wife with a tallow candle, his second with a kerosene lamp and his third with an electric light." I think he has done more to encourage strawberry growing than any man living or dead. I have slept with and talked fruit growing with him twenty nights. He still visits us about twice a year. I will recollect him as long as I do any one.

I can not stop without recalling the pleasant face and kind greeting of Hon. S. M. Owen. He was one of God's noblemen. We all loved him. Some years ago it was announced that he was sick and could not be with us. Your president appointed *Judge Moyer and myself to visit him and convey our sympathy,

*Since passed on.

and we did so. I felt it the greatest honor ever conferred on me to be asked to come to this city and speak at his memorial services of him as a friend of the farmers and of your society. I really felt inadequate for the task but responded to the best of my ability. This incident to me is one of my most cherished recollections.

I must speak of our dear Brother Harrison. I recollect saying that I intended to attend your meetings as long as he did, he being one year older than I am, but I begin to think he will tire me out. In talking to the students last year I recollect that he said that while I came they did not need any circus or vaudeville show. We like to see and hear him. When in language that none of us can imitate he appeals to the throne of Grace for help and blessings on this society, it makes one feel that he or she is near to the Portals of the Heavenly Kingdom. May God bless his efforts.

Now I must close without speaking in detail of a number of your members that I enjoyed associating with in days gone by. There was John Cummings, who was born the same year I was and only twenty miles from where I first saw the light. Pleasant visits with him, C. G. Patten and with Professor Waldron, Professor Hansen, John H. Stevens, Robertson, Mackintosh, McGuire, Washburn, Porter, Cady, Haecker, Mayne, Wood and Green are still fresh in my menory. The last named was the first to buy ten copies of the book I wrote to give to his friends.

I must in closing mention A. W. Sias and J. T. Grimes. As I recollect, they were the pioneers who first called my attention to the Virginia crab as a stock for successful top grafting, owing to its vigorous growth.

I will now close by giving you a thrilling incident in the life of my friend Peter Peffer. He came with his wife from Germany some sixty years ago and settled near Waukesha, Wis. He was large and strong and a great horticulturist. At first he dug and cleaned wells. While cleaning one twenty feet deep, walled up with large, round, hard-head stones, he felt the bottom stone giving away. He straightened up, and over his shoulders they crowded together and formed an arch, settling so much that those at the top thought he was crushed by the tons of stone. They at once sent a boy six miles for his wife. She came and saw the crowd standing around doing nothing. She said: "Where is Peter?" A man said, "He is dead in the bottom of this well." She said, "You must dig him out, he can't stay there." Then they got tools and went at it. They changed crews and went down fast. All at once they heard his voice. It scared them, and they ran from the job, but she called on new ones and set them at work. When near him he called to be careful, he was bracing up. Soon they had his head and shoulders un-

covered and a rope tied under his arms and they kept on taking out stones and dirt until they could draw him out. He told me that before he could see any light that his breathing began to grow shorter owing to a lack of fresh air. That evening before he went home they held a big party to celebrate his rescue and called it Peffer's timely and wonderful resurrection. The next year on the same date they held it again at his home, and they followed it up while he lived. In his later years his friends in Milwaukee would come out forty or fifty strong in a special car and keep it up all night. Out of curiosity and at his invitation, I attended once. It was certainly a miraculous escape from death, and he afterwards lived to help introduce Peter Gideon to your society in this city. Members, I thank you.

TRUMAN M. SMITH—eight years president.

Greeting by a Charter Member.

C. L. SMITH, PORTLAND, OREGON.

I hardly know what to say; there is so much I would like to say and I know that the time is short. I was thinking as I sat here this afternoon, what an inspiration the next annual report of the Minnesota Horticultural Society will be to all the young men and women who read the report of this afternoon program.

Another thing. The work of these men which have been eulogized was always done through a love of their work. They loved their work, they loved their fellowmen, their work was unselfish. I don't believe anyone ever gave time and effort to the work of the Minnesota Horticultural Society with the idea that they were going to be materially benefited individually by that work. They attended the meetings and paid their own expenses.

What better can a man leave, what better record for his children, for his neighbors, than that his best efforts in life have been unselfish. As one of the poets says:

All hearts grow warmer in the presence
Of one who, seeking not his own,
Gives freely for the sake of giving,
Nor seeks for self the harvest sown.

The harvest has certainly been greater than the sowers ever expected.

I was an enthusiastic horticulturist fifty years ago, and I really did believe that in the course of fifty years the men and women living in Minnesota, the boys and girls on Minnesota farms, would be able to have perhaps some Duchess apples and Siberian crabs and Transcendent and Hyslop. I think the first work I ever did in Minnesota was to sell some farmer half a dozen Hyslop crab trees. They were pretty good, they were much better than nothing, and they were as good as we thought we would ever get.

Just a word reminiscent. At the time that the society was organized I was canvassing for the sale of nursery stock for Samuel Morrison, of the old Rochester Nurseries. I don't claim to have been a very bright boy. I never had any schooling, and education. I lived down in southern Indiana among the hoosiers, three years before the outbreak of the war, and I learned to bud and graft. I had a chance to read some old files of the American Horticulturist, edited by Downing, and I had become

very much interested in them, but that was as far as any idea of horticulture went with me. When I was offered a position to canvass for the sale of nursery stock, it seemed to be the best thing I could do, and I started out.

I talked with the farmers from farmhouse to farmhouse, and before the season was out I concluded that Rochester, New York, was not the place to grow trees and vines to plant on the Minnesota prairies. So you see I reached the right conclusion. When I came to make delivery that fall at Wabasha, one of the men who had ordered some Hyslop crab trees,—and by the way, those had been grafted on some old cull trees in the nursery and they were two, three or four years old roots with a one year's growth, and had thrown out a lot of side limbs—the man asked me how to trim those trees. I took out my knife and showed him how to trim them, and he thought that while I was about it I might as well finish trimming and I did.

When I got through I had a nice bunch of sprouts lying on the ground. I gathered them up and tied a string around them. There was something like ten or twelve hundred trees I delivered, and I offered to trim every one of them, and I got those scions. I knew a woman, Mrs. Barton, at Zumbro Falls, who had shipped to her from New York three barrels of apples. She insisted that the children save every apple seed, and she planted all of those seeds in the garden. She had raised some fine apple seedlings. I traded for some of her seedlings and planted them in Mrs. McDonald's garden, at Wabasha. I am proud of this fact, that of the four thousand odd Hyslop crabs I grew from those trees, a large per cent., are still alive and growing in the state of Minnesota.

Like a great many others, the next year I got married, and I went out on the prairie in southern Minnesota and was going into the nursery business on a big scale. I invested every dollar of money I had in apple seedling roots and scions of Hyslop, Transcendent and Duchess of Oldenburg. That was in the year 1868. I worked all winter grafting in a small room with a hot fire. It was a very cold, hard winter—I wasn't strong or healthy anyway—with the result that when I had my winter's work packed away in a dirt cellar under the house, I was taken sick, and I didn't get off the bed for two months. When I finally did get up—my wife wasn't looking—I staggered across the floor and opened the door that went under the stairway to the cellar, and I was confronted with a box of my root grafts floating

on the water in the dirt cellar and the sprouts growing out of the cracks in the box.

That particular winter finished me in the nursery business. I lost it all. I struggled along for three or four years, when a man persuaded me to leave the nursery business and take up something that wouldn't spoil. So I began to sell sewing machines. But I never lost my love for horticulture, and I used to talk horticulture to the farmers when I went about the country. I bought a little piece of land at Faribault and planted trees. Because of those trees I came to Minneapolis, and was hired to settle up some business here, and I got a chance to sell a lot of shade trees. I attended the meeting over at the University in 1883 and immediately began to take an active part in the work of the society.

That is why, if you look over the reports you will see that between the years 1867 and 1883 C. L. Smith wasn't there. It was not because I was not interested in horticulture. I lived neighbor to one of the oldest pioneer horticulturists of Minnesota, a man who did a good deal for the work of horticulture, D. W. Humphrey, of Faribault. His place stands there now in sight of the Milwaukee track as a monument to his interest in tree planting and tree growing.

During all this time, as I say, I was interested in horticultude; I talked horticulture wherever I went. Why? Because I wanted to see people get more out of life than the man was getting who simply worked for the money he could make. I learned in those early years that the man who worked just for money was a failure no matter how much money he got, while the man who worked for love of humanity or for love of his work was happy if he didn't get anything—and he got more out of life, even if he didn't get any money benefit, he really got more out of life, more value out of life, than the man who accumulated a fortune but got it through treachery, not through love of the work he was doing.

I want to say a few words about some of those men that have been mentioned here. Fortunately during that period I became acquainted with such men as D. W. Humphrey, Col. John H. Stevens and Wyman Elliot—and I want to say right here I have accomplished what few men in life have, reached the very height of my ambition, and that is due more to John H. Stevens and Wyman Elliot than it was to anything inherent in myself, because they were the ones who inspired me and started me on the right road.

The first article that I ever wrote for publication was suggested and edited by Col. John H. Stevens, and I received for it $22.00, and they were the biggest dollars that I ever received in my life. I needed them and needed them badly. I had a wife and five babies, and we hadn't any wood or coal or flour, and we needed that $22.00 and we needed it mighty bad. It was Col. John H. Stevens that encouraged me to write that article and then edited it.

Just ten days after that time I got a request from the "Massachusetts Plowman," at Boston, Massachusetts, to furnish a history of the Wealthy apple, which I wrote from such information as I could get and sent it down to him, and he sent me a check for $25.00. That was the second money I got, and I began to think that was a pretty good way to make money.

Then came the farmers' institutes. Col. Stevens was booked at the opening session at Glencoe and was taken sick and couldn't go, and insisted that I should go in his place. It was to be a talk on diversified farming as compared to a single crop system. I had stage fright but the colonel said: "Now, Smith, just shut your eyes and imagine you are talking to me and tell your pig stories just the same as you are telling them to me." He was lying on the bed sick with acute indigestion.

I went to Glencoe and made a talk there. Just made a talk, it couldn't in any sense be called a speech; I simply told stories about the men and women I had met on the farms in Minnesota, the things they were doing and the results that they got and contrasted them with other people who were doing differently. Well, I didn't think very much of it then, I was too badly scared to understand much about it, but do you know I was surprised the next morning to find that some newspaper reporters had given a column to my stories and an inch to a very able lecture by a professor. You know I thought I had struck yellow, yes, sir, I did.

I got another lesson that same winter. I attended a farmers' institute and quite a number of the people from the University were there and different ones. They had a nice meeting, and they gave up one whole evening to the discussion of the farm boy, largely theoretical, because there were two bachelors and one old maid among the speakers, and it didn't exactly suit me. So I wrote an article on the subject, theoretical—I didn't realize it then, but I do now. I was very careful about it. I sent it to the editor with the idea that I would get a good check for it,

and I got the best lesson of my life. I had the manuscript returned to me two days later and the editor had written with blue pencil: "Plenty of money to pay for anything you know, not a blank cent for what you think about anything." (Laughter.)

I thought I would have to know more, and I promised myself then that if anybody asked a question, and I could not give an intelligent answer to it, whether they asked it of me or somebody else in my hearing, I was going to learn the answer to that question, and I have practiced this ever since. I don't want to boast, but I will say that I found a man who appreciated what I knew and what I could do well enough so that he is paying me more money than I want. Not many of you are getting that, are you? Paying all my expenses, even to attend this horticultural meeting down here and have a pretty good time, and it is largely due to the instruction that I got from the Minnesota Horticultural Society and the grand men that made this society. (Applause.)

Mr. Underwood: I think Mr. Smith told me he had twenty-one grandchildren. I think that must have had something to do with his success.

Mr. Smith: Mr. Underwood, I haven't twenty-one, but I have eighteen, and they all think so much of their grandpa that I have to spend about one-half of my salary or more on them every month, and I never spent any money for anything in my life that gave me so much satisfaction as that.

Recollections.

GEO. W. KELLOGG, JANESVILLE, WIS.

My first attendance at Minnesota State Horticultural Society meetings dates back thirty-five or thirty-six years, at the time when you had no money to pay the board of your delegates and you boarded them round as we school teachers used to do. I was boarded by a Mr. Johnson, a lumberman on the East Side. One morning he brought me to the meeting in his cutter and I froze my cheek. At another time Edson Gaylord, of Iowa, requested that he be assigned to the same house and room with me. Well, we did no sleeping till after midnight; he had "sun-scald" on the brain. At one of my June visits your society furnished carriages and took the delegates twenty-five or thirty miles through acres and acres of strawberry fields.

At one of the winter meetings, A. W. Sias made a report of a trial orchard, giving the names of about twenty kinds of apples. "They all made a good growth but were all dead"—he read the results after each kind. He said, "it was rather monotonous, but it was true." Twice I exhibited strawberries at your June meetings, and I always thought I received more premiums than I was entitled to. With the exception of the winter I was in California and the two in Texas, I think I have not missed a meeting, and they are better and better every year.

Ladies of the Society.

MRS. JENNIE STAGER, SAUK RAPIDS.

It was in 1886 that I came to Minnesota, and as green as a New York City woman could be about making a garden or raising fruit. I had a piece of ground broken up which had never been cultivated before, and set out on it a thousand strawberry plants I had sent for. Of course I had no idea how many were needed to furnish fruit for a small family. Well the next spring I began to taste them in anticipation. On uncovering the plants I noticed they looked sick, and I found the grub worms had eaten the roots. My feast was in the discard. At that time very little of any fruit could be bought here, and the strawberries offered for sale were about as large as a gooseberry, and having been used to fruit the year around I inquired around to see if I could get the modus operandi of how to raise fruit. Someone told me of a horticultural society which would meet in Minneapolis somewhere and at some time in the winter. Finding the time and place I was on hand. The meeting was held in a room over old City Market opposite the depot. At the farther end of the room was a long table, behind which sat a number of very intelligent looking men, and in the middle, looking a veritable king amidst his adherents, was the president, Wyman Elliot. Then I noticed at the left a very beautiful old lady, whom later I found to be a Mrs. Van Cleve. Also I met at that time, Mrs. F. G. Gould and Mrs. J. M. Underwood. In some mysterious way I felt I had gone into a family meeting and was not among strangers.

The annual membership for that year I think was ninety-nine and mostly men. I am supposed to talk of the ladies, but how can I help speaking of those noble men, Elliot, Sias, Harris, Dart, Underwood, Gould, Porter, Sargeant, Green, Gideon, Grimes, Patten, Smith, Latham, and many others, as Col. Stevens and Mr. Owen, who were doing so much, without thought of money or reward to make Minnesota one of the foremost fruit growing states in the Union, and thereby blessing its inhabitants against hard climatic conditions. I think you will allow they have accomplished it. Witness our exhibits and premiums at New Orleans, and we are still progressing.

Many of those old members have crossed the Great Divide, but we keep them in our memory and our hearts, and the feeling of kinship and brotherhood that emanated from that meeting to

the stranger within their gates has grown, until this society has become the largest of its kind in the world. Fruit also is grown so plentifully in all parts of the state, where only a few wild berries or puckery plums were found, that the poorest children can have their fill. As for our members, they come from the Atlantic to the Pacific, Canada also giving us its quota.

The next year Mrs. Cross came with me and was with us until last year when she went to sleep. The year after Mrs. Thayer, Mrs. Sartell, and several other ladies from our part of the state, came down to help with the good work. We found Miss Sarah Manning, Miss White and quite a number of other ladies, including Mrs. Green, Mrs. Bonniwell, and last but not least Mrs. A. A. Kennedy, of Hutchinson, a minister's wife with illimitable humor, which we all enjoyed. There were three of us at the same hotel with her. She told us it was the first genuine outing she had ever had the chance to enjoy, so we three set out to give her the time of her life. Needless to say, we did it, and she started home to rejuvenate her Reverend.

Then there was Mrs. Tillotson, Dr. Mary Whetstone, Mrs. Ruff, Mrs. Alderman, Miss Emma V. White (we are always lost until we see her) Mrs. Tillotson, Mrs. Barton, Mrs. Cuzner, Mrs. Gibbs, Mrs. Sawyer, Mrs. Boardman, Mrs. Kingsbury, Mrs. Wedge, Mrs. Countryman, Miss Gertrude Cairns—then Mrs. Knowles with her seedling apple and sweetmeats. These and many others pass before our vision shedding the blessing of their presence on the society, and we certainly do miss Mrs. Underwood with her gentle ways, when for any reason she fails to appear, and I am sure we would all miss Miss Esther (the secretary's assistant for ten years) were she not here. But there, I could go on indefinitely and then not tell you the names and good qualities of half of the ladies who have honored us by joining and working for the Minnesota State Horticultural Society.

UPPER ROW—W. E. Fryer, Mantorville; Chas. M. Loring, Minneapolis; Rev. C. S. Harrison, York, Neb.; Wyman Elliot, deceased; A. J Philips, deceased; F. H. Nutter, Minneapolis.
LOWER ROW—Geo. J. Kellogg, Jaynesville. Wis.; Prof. N. E. Hansen, Brookings, S. D.; A. D. Barnes, Waupaca, Wis.; R. H. Pendergast, deceased; Lycurgus R. Moyer, deceased; C. E. Older, Luverne; Dewain Cook, Jeffers.
From photo taken at Annual Meeting, 1903.

Greeting from the Department of Agriculture and Forestry, University of Minnesota.

A. F. WOODS, DEAN.

It is with mingled feelings of love, loyalty and pride that I bring you greetings, dear Mother of Minnesota Horticulture, on this your fiftieth birthday. Each year has added to your beauty and strength and to your power to foster the great ends for which you came into being. The great Northwest owes to you a debt of gratitude that it can pay only by helping you to promote the arts and sciences of horticulture. The names on your roll of fame are many. They are remembered not only for what they have done in horticulture but for their helpful, neighborly, brotherly, cooperative spirit. The progress of horticulture in the University, from Gideon to Green, is due to your interest and fostering care. These famous names are as dear to you as to us. On the foundations so well laid, we hope to build a great superstructure. We know that your guiding and sustaining hands will always be near. Our horticultural department is your oldest child, and though you are still young and able to take care of yourself, we want you to come and live with us. Your motherly presence and influence will be a great joy to us and a great inspiration and help to the boys and girls. We hope that you will not long delay your coming and that with us you may celebrate many happy returns of this semi-centennial anniversary.

The glory of horticulture is embodied in the glory of the garden. Rudyard Kipling has left us a poem on this theme.

Our England is a garden that is full of stately views,
Of borders, beds and shrubbery, and lawns and avenues,
With statues on the terrace and peacocks strutting by;
But the glory of the garden lies in more than meets the eye.

For where the old thick laurels grow along the thin red wall,
You'll find the tool and potting sheds, which are the heart of all,
The cold frames and the hothouses, the dung pits and the tanks,
The rollers, carts and drain pipes, with the barrows and the planks.

And there you'll see the gardeners, the men and 'prentice boys
Told off to do as they are bid and do it without noise;
For, except when seeds are planted, and we shout to scare the birds,
The glory of the garden occupieth all who come with words.

Our England is a garden, and such gardens are not made
By singing, "Oh, how beautiful," and sitting in the shade,
While better men than we go out and start their working lives
At grubbing weeds from gravel paths with broken dinner knives.

There's not a pair of legs so thin, there's not a head so thick,
There's not a hand so weak and white, nor yet a heart so sick,
But it can find some needful job that's crying to be done,
For the Glory of the Garden glorifieth every one.

Then seek your job with thankfulness and work till further orders,
If it's only netting strawberries or killing slugs on borders;
And when your back stops aching and your hands begin to harden,
You will find yourself a partner in the Glory of the Garden.

Oh, Adam was a gardener, and God, who made him, sees
That a half a proper gardener's work is done upon his knees,
So when your work is finished, you can wash your hands and pray
For the Glory of the Garden that it may not pass away.
And the Glory of the Garden, it shall never pass away.

PROF. SAMUEL B. GREEN,
From a photo taken about 1900.

MRS. A. A. KENNEDY.

The Minnesota Society and the Northwest.

PROF. C. B. WALDRON, AGRICULTURAL COLLEGE, N. D.

When the three goddesses of our plant world were choosing their several dominions, Flora and Pomona sought out the soft and gentle climes where mild winds were and copious showers that brought forth flower and fruit in generous abundance. To the Goddess Ceres, she of sturdier, hardier mold, was left the regions where Boreas comes with white storm wings, sweeping before him in his ruthless flight the fair, frail flowers and all the gardens hung with fruits. And the men of the north worshipped and served Ceres, and the great plains became vast fields of grain where summer after summer the harvester went forth to gather the myriads of golden bushels that were to fill the granaries and feed the multitudes of men in all the earth.

But there were those among the men who were not content merely with fields that were green, then gold and last but barren stubble. They served Ceres well with honest toil, but in their hearts they paid homage to Pomona and her fair sister Flora. Could they by their zeal and faithfulness induce those divinities to bestow their gracious gifts, ever so sparingly, in a harsh and rigorous clime?

There was hope, for even before man came there were summer flowers that lived their brief season through, passing the winter in dormant root or bulb or seed, nestled close to the protecting bosom of mother earth, while here and there at the edge of the forest or along the coulees and sheltering slopes a hardy plum tree reared its defiant head, and brave, wild strawberries made friends with the chirping cricket and the brooding sparrow among the protecting grasses.

And because of the promise implied in the presence of a few wild fruits here and there, and because of the hope that prompted men to try and try again after many failures and discouragements, in first this garden and then that, a few apple and plum trees were found growing, tended by loving, faithful hands, while lilies and iris and peonies gave their touch of warmth and color to many a settler's home.

In most cases the apple trees were short lived, and almost before they bore their first fruits they had yielded to the winter's rigors. But some of these bore fruit, and the seed was carefully planted in the hope that out of the succeeding generations might

come a few trees so hardy and enduring as to thrive in their uncongenial home.

The men and women who carefully planted and faithfully tended, a half century and more ago, were brave and persistent to the last degree, but none so confident and determined but to feel the need of the advice and encouragement of others—and so the society, whose jubilee year we now celebrate, came into existence.

It is not an easy thing to tell what the influence of one single man has been who through fifty years of storm and sunshine has kept to his course, performing his own tasks faithfully and well and helping others to a higher and fuller achievement. Who then has discernment so clear and accurate, and knowledge so extensive, as to know and tell what the influence of a great organization has been through the half century that has seen the Northwest develop from a straggling, struggling frontier to a substantial and thrifty region having but few counterparts on the face of the earth?

In the first place, while you expect and receive many benefits because of your membership in this society yet none of you joined because of any fancied pecuniary gain. The motives that bring you together year after year are not those of selfishness but rather of helpfulness and encouragement and devotion to a worthy cause.

Your primary motive is to make for yourselves and others—always the others—more beautiful surroundings and to give to people more pleasures, a healthier and more appetizing diet and a taste and love for the higher and more satisfying forms of enjoyment. In your modesty you will refuse to accept such encomiums, but what one of you if you found growing in your garden the perfect apple tree with ideal fruit could sleep nights till all your brother horticulturists were furnished scions that they might share its blessings with you. And, if any brother should prove skeptical and refuse the offer, by some cunning subterfuge you would contrive to engraft his Hibernals and Virginias with your own choice fruit—so far does your altruism go.

For fifty years you have lived the principle that society is just beginning to learn—that the ideal citizen must be something more than merely just and law abiding—he must concern himself with the welfare of others and give himself in a measure for the good of all. What your influence has been in this regard

is worth all your efforts, though never a tree should yield to you its toothsome offering nor a flower bloom to reward you.

It is impossible to place before your eyes a picture of the Northwest as it now is, with its hundreds of promising gardens and orchards, and point out the items and features that owe their existence to the influence of this society. Perhaps it is not too much to say that no other one organization or factor, public or private, has done so much to bring about the conditions that we now find.

The Wealthy has recently been pronounced by a high authority, not a resident of the Northwest, our country's one most valuable variety of apple. This opinion is based on the consideration that if a man could have but one apple tree the Wealthy would serve him better throughout the year than any other kind.

This is your own daughter, born and christened in this society, now grown by the thousands of barrels, and yet until a few years ago none of us ever heard the Wealthy mentioned except by members of this society. You have spoken the name so long and persistently that not only the Northwest but the whole country has heard and become convinced.

You can all readily bring to mind a number of other apples like the Excelsior, Dartt, Lyman, Okabena, Florence, Minnesota and Patten that originated with members of this society and have been brought to public attention through your efforts. The same is also true of different worthy varieties of other fruits, like the Aitkin, Harrison, New Ulm, Odegard, Rollingstone and Surprise plums and of many vegetables and flowers.

It took your experience, as related at these annual meetings and published in your Horticulturist, to bring to our minds the fact that much we had learned in our books wasn't true. Partly as a result of this there has grown up within the last few years a literature of horticulture so practical and dependable that there is no one so new and unskilled in the divine art of growing things that he need become the object of his neighbor's mirth.

It is impossible to suggest any topic in horticultural practice, from cover crops to top grafting, or from bug killing to marketing, that has not had its pros and cons presented here by members rich in experience. That you haven't always subscribed to the same horticultural doctrines has not lessened the value of the discussions, though it has certainly added ginger and sometimes a little pepper to the occasion. If your opponent hasn't

always convinced you that he was much of a horticulturist, he has frequently given you cause to respect his ability as a debater.

The first missionary service by a member of this society that came under my own observation was twenty-six years ago this winter, when your honored member, Mr. J. S. Harris, gave a series of practical talks on fruit growing to the first body of students ever assembled at the North Dakota Agricultural College. Those talks must have had their effect, for some of those boys, to my own knowledge, are still growing fruit. Their own sons are following their example, and who can say when the influence of that one single month's work will ever end?

There is scarcely any one to be found in my own state who attempts to grow fruit who is not more or less familiar with the activities of this society and the things it has accomplished. Through the fruit exhibits at your state fair they have come to know you, and how can you be better judged than by your fruits?

You have a fruit breeding station, because of the campaign carried on by this society in which the results already obtained are attracting the attention not of the Northwest merely but of the whole country.

But the best that can be said of you is that you are not resting upon your laurels. Your influence is being felt far beyond your own borders, not wholly because of what you have done but because of what you are doing and will do.

We know that your thousand dollar offer for a better apple is not a bluff. You have made the promise in good faith fully expecting that in the years to come somebody will claim the reward. You have high hopes, but they are well grounded; visions bright and lively, but not chimerical; a purpose fixed and determined, but as kindly and gracious as the flower you grow.

Your ways are modest and you walk humbly, but your light has gone forth to guide the steps of hundreds that gladly pay their homage and repay you with what they have—their best efforts and their gratitude.

UPPER ROW—Prof. C. B. Waldron, Agri. College, N. D.; T. T. Smith, Cal.; A. W. Latham, Minneapolis; Prof. Thos. Shaw, St. Paul; O. M. Lord, deceased; A. J. Philips, deceased.
LOWER ROW—Chas. M. Loring, Minneapolis; J. R. Cummings, Minneapolis; J. M. Underwood, Lake City; Prof. W. W. Pendergast, deceased; O. C. Gregg, Lynd; H. H. Heins, Olivia.
From photo taken at Summer Meeting in summer of 1902.

Forecasting the Future of the Society.

REV. C. S. HARRISON, YORK, NEB.

In looking ahead we are to take into account the growth of the esthetic spirit—or the growing love for the beautiful. Fifty years ago there was a struggle for the necessaries of life.

There are three steps in the development of a new country:

First, the demands of the stomach must be regarded, for we must be strong for labor, and so food is one of the prime essentials.

In the next stage regard is also paid to the demands of the palate, and so we minister to our tastes, and pleasant things, like fruits, must be grown. We recognize also the fact that fruits are of prime importance for health and are much cheaper than doctors.

Then comes the development of the love of the beautiful. When God finished the world and ripened it for man, He planted it to flowers. These are the smiles of God. And the great families of them with which He planted the world, from the tropics to the great tundras of the North, attest His kindness, forethought and marvelous skill. So we should keep step with Him. We are to recognize the necessity of human aid in developing the Divine plans.

There is the daily prayer offered by prattling children and decrepit age: "Give us this day our daily bread." But the prayer is answered through human aid. God furnishes the capital and we the labor. He spreads fertility on these vast plains, He loads the mighty squadrons of the sky from his viewless pumps out on the oceans, and the fleets of the air wing their way in His viewless aeroplanes and pour their treasures on the earth. He puts vital forces in those lances of light which come pushing from the sun, and energizes the unseen forces of nature, and there He stops. Man must come in with his plows, harrows, drills, reapers, threshing machines and bakeries. In answer to prayer, He does not rain down loaves of bread from the heavens, but depends on His earthly partners to do the work after He has furnished the capital.

So in the floral world He furnishes the species, and man the varieties. He gave the single dahlia, and in thousands of experiments men have divided that primitive flower into so many families that their old mother would not know them. The primi-

tive phlox, which was like a wild, hardy Indian maiden, has been transformed into hundreds of forms of imperial beauty fit to adorn the palaces of kings. The great peony family sprung mostly from the alba flora of China. Skilled propagators have given us over 2,000 named varieties. The canna, growing wild on the banks of rivers in tropic and semi-tropic regions, had fine foliage, and was first grown as a foliage plant. Then enterprising florists conceived the idea of improving the flowers, one man making 40,000 crosses, till now it is one of the crowning glories of our summers.

So in forecasting our future we step in and possess the fruits of most patient toil.

The vegetable garden feeds the body, the flower garden feeds the soul.

The Arnold Arboretum is the culmination of this third degree of development. I have wandered with the superintendent among 150 kinds of lilacs in full bloom, most of them hardy in the North. I once rode with him on the cars when he had six kinds of hybrid roses of his own creation. He once put a trailing juniper on a red cedar and had an evergreen umbrella, and sold it for $50.00. Prof. Jack, of the Arboretum Institute, who used my peony manual as a text book, sent me one of Wilson's collection of the iris. It proved one of the most remarkable plants I ever saw. It had a little blue flower, but the foliage surpassed anything ever known. It was a mound of vivid green, fresh till midsummer. A border of this wonderful plant would excel in beauty anything else.

Wilson, sent out by the Arboretum, went through no end of difficulties and dangers in the mountains of north China, having his leg broken by a mud avalanche. Yet he secured a large collection of the seeds, choice evergreens and deciduous trees, besides a vast collection of flowering shrubs and flowers. These will soon be disseminated, and you will have your pick of the best the world affords.

As to fruits, look back fifty years and see what you have done and then look forward and see what you can do and will do. With hundreds at work producing new seedlings you are sure of splendid success.

Among your number you have the world's greatest pomologist, Chas. G. Patten. He and I are of the same age. Both spared by a kind Providence for some good reason. He will pass on, but

his work will remain. Great successes are yet to fall from the deft fingers of Hansen and Haralson. Perhaps the latter can secure a strawberry which will excel his No. 3. If so he will be nature's miracle worker.

Among flowers you have the Brands who stand among the world's greatest propagators of the peony. And they, with their careful work, saving but one out of a thousand, are sure to give in the future, as they have in the past, astonishing forms of loveliness.

Among the iris your Wm. Fryer, of Mantorville, now takes the lead, and he has only begun his work. Others will fall into line, for there is no flower that blooms more susceptible of improvement than the iris. Some of our recent importations from Holland and England, in their dazzling beauty, defy description.

There are three species of the wild olive which have a future. Our buffalo berry, the Siberian sand thorn and a kindred fruit from Japan. This last is an enormous bearer. I have picked a gallon from a single bush in Massachusetts, where they are much prized for jellies. Hansen will find some way to blend them so we will have a fine winter currant. What improvements have been made in your native plums, and you may yet surpass the Wealthy and Patten's Greening. The apple needs a cool climate. You cannot raise them in the low grounds of California or in the Gulf states. The farther north you go or the higher up in the mountains, the finer they are. Your newly developed system of top-grafting adds prolificness and hardiness so you can move the apple belt hundreds of miles north.

You succeed well with evergreens, and soon you will have adequate protection for your homes.

There is no land or clime better adapted to fruits and flowers than yours. There must have been a strain of poetry in the Indian who called it Minnesota, land of the sky-tinted waters. Yours is by far the most beautiful state in the Union. The mountain states surpass you in sublimity, but yours is peerless in beauty.

The glory of her June, embellished by nature and art, her rich soil and congenial climate place her at the front. Where are mornings ushered in with such beauty? Was ever land adorned with such resplendent sunsets? When the weary day departs for her repose what escorts she has! The curtains of the evening are painted with molten gems. The mantles of the sun are hung there. She parts the folds and passes on escorted by a pageantry no earthly monarch ever dreamed of.

And what peaceful nights when heaven's arch is kalsomined with blue and sprinkled with stars, and the sweet silence is eloquent with unuttered praise!

Look over your land where the lakes are sown broadcast, and they flash and sparkle like diamonds on the bosom of mother

earth. Joyfully the streams murmur their soothing songs as they hurry on to be embraced by the father of waters.

I peer into the future where my faltering steps cannot go and these eyes will be ever closed, and there will arise a vision of loveliness, when the labor of art will combine with that of nature, and human skill will match the beauty of land and sky, and Minnesota will shine as the fairest star in the galaxy of our beloved land.

Col. John H. Stevens—first settler of Minneapolis.

PLANTING LAWN BORDER ON TOP OF LAKE BLUFF. VIEW ON UPPER LAKE MINNETONKA.

While it is not the intention to publish anything in this magazine that is misleadng or unreliable, yet it must be remembered that the articles published herein recite the experience and opinions of their writers, and this fact must always be noted in estimating their practical value.

THE MINNESOTA HORTICULTURIST

Vol. 45 DECEMBER, 1917 No. 12

Ornamentation of Home Grounds.

AN ADDRESS AT THE 1916 ANNUAL MEETING BY CHARLES H. RAMSDELL, LANDSCAPE ARCHITECT, MINNEAPOLIS.

I intend in this address to cover some phases of home decoration and ornamentation of grounds, which includes grading, the planting of appropriate trees, shrubs and vines, the designing of gardens, the laying out of walks and drives, the views towards the house and from the house, which are of primary importance in the lay-out of any home grounds.

The importance of grading is something which is very seldom properly attended to. The slopes are made straight and angular and run level without any attention being given to the need of it, and when the work is done it is artificial and looks artificial. If proper attention is given to the slopes so that we have the round O G slopes or curves that you find on the natural hills and knolls, when the grading is completed you find that it looks so natural that oftentimes it will be mistaken for a piece of natural surface instead of newly graded ground.

Then too in these days, after forty or fifty years of horticultural work, we find in every city large numbers of poor trees or trees that should be removed, those which are undersized and which are badly scarred by sun-scalds and by the wind and the weather. On many places, especially those that have been established thirty years, we oftentimes find half the trees superfluous because if the extra trees are not removed then the ones which are left are made to grow out of shape and to under-develop, and therefore we lose a chance to make a fine permanent tree. In every city you find lines of elm trees planted fifteen or twenty feet apart, specimens which are without any side branches and with very little of the attractiveness which the elm should have.

If fifteen or twenty years ago every other tree had been removed, the trees which were left would have been twice as good in their proportions and character.

If the house is established, and we have fine trees which are of good size, the importance of tree and shrub planting is not so vital, but there are so many places, especially in the newer regions of our city, where the house site and the school site are without a single tree or shrub. Of course the permanent improvement is the tree. Shrub planting is a good material to use at first but should not be relied on altogether for permanent results, because certain shrubs are overgrown in five years or more and then have to be trimmed back or replanted. For that reason I always like to secure good permanent trees, such as mountain ash, elms, hackberries, basswoods and all the ornamentals which you know so well. These give the permanent effect we need.

If you have a group of trees which is overgrown and the center ones are spindling, if every other tree is taken out the other ones will have a better chance to develop. Then too you can correct the shape of the tree by careful trimming in the matter of taking out certain limbs, the large limbs which cross each other, the limbs which interfere with another tree or the limbs which hang down and spoil the shape of the tree. Then in a few years the tree will fill out and a better permanent tree will result.

I want to urge the desirability of using the native shrubbery we find growing so plentifully all about us. It is hardy and desirable and has the added advantage of being very inexpensive. One of my superintendents recently did some collecting in Wisconsin, near Eau Claire. He collected nine thousand native shrubs at a cost of three cents apiece, which is going to help materially to keep down the expense of a piece of work. Among these shrubs which he collected are many varieties which are grown in the nurseries, although of course nursery stock is the best and easiest to transplant.

Among the plants which we found there were the high bush cranberry, which has the fine red berries in the fall, and the red-berried elder, which has a beautiful white bloom in July and then a heavy yield of bright red berries in August. Then the sumach of course we all know; it is hard to find any foliage which is more tropical and more attractive in its effect. Then

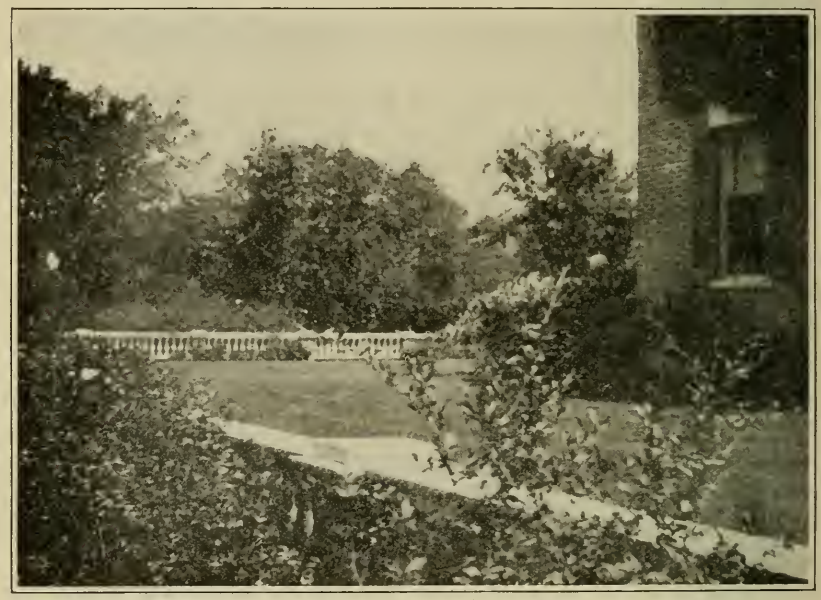
we found the wild black currant and the wild gooseberry, which have fairly palatable fruit, and many others which you would find very useful in carrying out a large piece of planting. The native material can be picked up nearby, especially along the rivers and ravines. Using these on the outside of the property, it is very easy to screen views of the barnyard and make an attractive planting along fences and borders to the lawn. Then as you approach the house, the varieties which we see grown so widely in the nurseries, lilacs, honeysuckles, snowberries, syringas and hydrangeas, all have their place and should be used as widely as possible.

In such planting work it is always wise to plan before you put in the beds what the uses are of the planting. For instance, if you wish to make a high bank of shrubs in front of the yard you would perhaps use such high plants as sumach, red-berried elder, honeysuckle and other plants of that character. If you want to frame in a view from the house, perhaps looking over the valley of a river or down a creek, then use lower material which grows well, such as Indian currant, snowberry, thunbergia, barberry and hydrangea. In planting around the gardens, of course, the use of native material is not exactly in good taste for the reason that in your garden you wish to have as many flowers in as little space as possible. This you don't get from the native material to such a degree as you do from the other horticultural material which you find listed in the nursery catalogs.

Then, of course, the use of appropriate trees is also important. For instance, if you wish to secure a little color around the house, use a mountain ash or a wild thorn or a low catalpa instead of planting a tall elm or the hackberry or the ash or basswood, which comes to perfection when it is fifty or seventy-five feet high. The importance of studying this planting before it is done almost determines the success of it. We see much planting done which is out of place, being poorly selected and improperly spaced and unsatisfactory because of the fact that certain kinds do not grow well together.

Around every city it is easy to find a lot of planting done which is improperly spaced. The theory of spacing in landscape planting is this: The shrubbery should be studied before it is used as to its permanent height, its permanent spread and the character of the stem as it comes from the ground. Then when

the plantation is made the shrub should be spaced so that when it is fully grown the foliage of each shrub will just touch the one next to it and no more. The idea is to shade the ground thoroughly and completely so that the grass will be shaded out and the weeds thus prevented from growing. Planting is often done which is spaced so closely that in three or four years the shrubs are spindling. Thus you lose both the effect of flower and foliage, but if they are properly spaced the shrub will arch



A terrace lawn with planting.

over, maintain its characteristic space and then the next one to it will merge with it. Then you will obtain mass effects of flowers or foliage, and instead of having one or two lilacs in bloom, then a space of lawn sixteen or eighteen or twenty feet and then two or three more lilacs, you will have four lilacs in bloom together. In that way, one secures mass effect instead of the scattered effects which one so often sees where the shrub is planted in sod.

Then another phase of the question—in which nurserymen will bear me out—is that no shrubs ever do so well if planted in grass as when planted in a properly prepared bed. One often sees shrubs well planted at the start, but in two or three years the grass rapidly grows towards the shrub and the shrub gets

sod-bound. Then we will find a lilac which stands still for six or eight years and never blooms, and the leaves will fall off, and the drouth will catch it, and that is because the grass is taking all the benefit of the soil and the shrub has to fight for what it does get underneath the roots of the grass.

But, on the other hand, when a bed is properly prepared the sod is well cut by a spade and the ground is thoroughly spaded over with the addition of good barnyard fertilizer. This prepares a bed in which the shrub will grow to the very best advantage. If a shrub bed of that kind is well planted and fairly well trimmed when young, it will succeed in nearly every season without much watering or even attention.

In the care and maintenance of public grounds I have found that in the care of a lawn the watering takes three times as long as in the case of properly prepared shrub beds. This is worth knowing, because many believe that a shrub bed is an expensive thing to maintain. If planted in well prepared ground they grow for many years without very much attention except possibly the removal of the older wood and the removal of the blossom heads and now and then a little trimming in the spring to correct the shape or to encourage the new growth of wood.

Mr. Scott: Will you mention a few of the shrubs that are quite generally used in our landscape work which need special winter protection?

Mr. Ramsdell: Of course, in our work we try to use nothing that requires winter protection, because the average man doesn't have the time to cover every plant as he should, but I can name a few which do better for the winter covering. The tamarisk is one plant with a feathery foliage and attractive pink blossom which should be covered. It kills back considerably each year, but it is a good thing to use. Of course the forsythias, or golden bells, are not often hardy, and here these should be protected. They are a fine shrub, but under ordinary conditions they winter-kill so much that they are not generally used. I presume likely some day some nurseryman will find a strain of hardy Japanese quince. In the southern section of this state this is fairly hardy, but in our section it kills back. The privet is also a tender shrub, but it is so desirable that it ought to be added to our list if possible. The California privet is the most valuable low-headed shrub which can be found in the warmer sections of the country, but it is not hardy with us. The Amur river privet ought to be hardy, and it may be that stock raised in a more northern latitude would be better, but up to this time it is not hardy. Then, of course, the sweet scented syringa, Philadelphus coronarius, is tender in some winters. It is not always in need of protection,

but sometimes it is killed back. These are a few of the shrubs which are tender with us.

A Member: What is your experience with the weigela rosea?

Mr. Ramsdell: It is fairly dependable but is benefited by some protection. It grows better in some locations than in others. I think it does better with protection, but on the other hand in sheltered locations near lakes or rivers where there is more humidity the weigela seems to be fairly hardy, and of course it is a very fine shrub to use. I use them a great deal in my work with good success, but I wouldn't say it is as dependably hardy as the lilac, the bridal wreath or the honeysuckle.

Mr. Horton: You speak about a proper spacing of shrubs. What would you consider the distance apart for spirea Van Houttii and hydrangea?

Mr. Ramsdell: The spirea Van Houttii I plant about three feet apart, never less than three feet, and occasionally where immediate effects are not desired as far apart as four feet, but more than four feet apart allows grass and weeds to grow between. The hydrangea I should say from two and one-half to three feet; if they have a wet location three feet is all right.

A Member: What has been your experience with flowering almond?

Mr. Ramsdell: That is a shrub I never found fully hardy. I put it into the class with the weigela, well worth planting and protecting but not wholly hardy. It is a beautiful shrub of its kind. It has type, it is different from every other shrub, and I like to use it, but I am careful with it.

A Member: What makes the best hedge?

Mr. Ramsdell: It depends a great deal on what you wish the hedge to serve. If you wanted to divide fields to turn stock, the buckthorn after it gets to be twelve or fifteen years old is so stiff and heavy that the average cow will leave it alone. That is a good field hedge. You can screen a fence with it. Around the garden I like to use the tartarian honeysuckle, which grows straight and takes trimming very naturally; it has a fine flower and good foliage. The lilac, of course, makes a good informal hedge; it can not be trimmed to very good advantage. Some of the spireas are fairly good if you wish an informal hedge. Thunberg's barberry makes the best low hedge we have. That can be trimmed twelve to twenty inches high and makes almost as good a hedge in its effect as the box, which we find in the east.

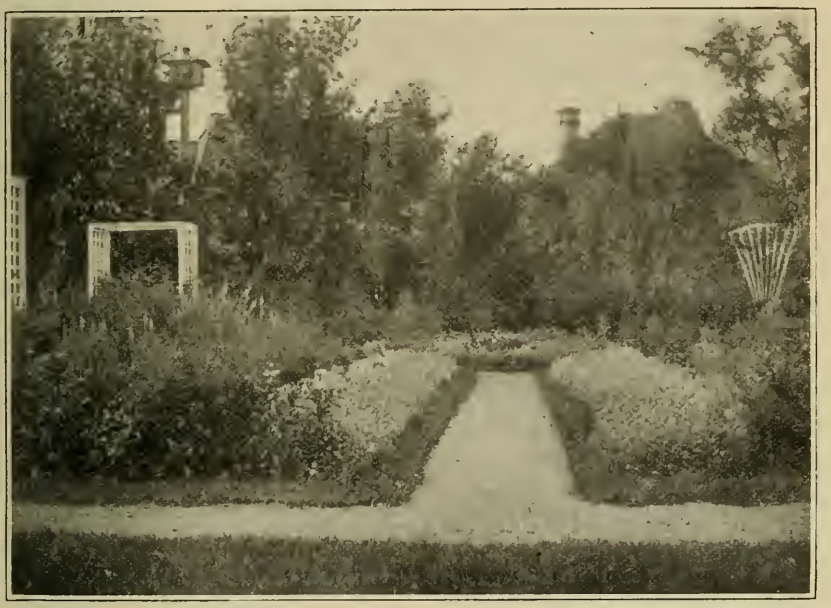
A Member: Which grows the fastest?

Mr. Ramsdell: I think the buckthorn grows as fast as anything I know of if in good soil.

A Member: What variety of lilac do you recommend?

Mr. Ramsdell: There are so many varieties of lilacs one can easily make a collection and not overdo it. You will find that

the season of bloom in lilacs lasts for six weeks if you combine varieties. Of course, the standard purple lilac has many good forms now, such as the Charles X, generally raised by the French; the white lilac, the old-fashioned white lilac, is fine and has many good varieties, some of them double and very fine. Then the Persian lilac is favored by many people. That comes in white forms and double forms as well as the standard pink form. I have used the Hungarian lilac. It isn't often seen, but I consider it one of the best. It has a glossy dark green leaf, a good deal like a bay tree, and has pink blossoms somewhat



A good mass effect of flowers.

later than the others. The family, as I said, is one of our most valuable horticultural families.

Prof. Hansen: How about the caragana?

Mr. Ramsdell: It makes a fine hedge, it stands trimming well and is as hardy as anything you can find. I didn't mean to miss that in my list of hedge plants.

Prof. Hansen: How far apart are they planted?

Mr. Ramsdell: It depends on how quickly you want the hedge. If you want it quickly, one to two feet. One foot may be a little close, but two feet, I should say, would be about the right distance to give a heavy hedge.

Prof. Hansen: How does caragana pygmaea do down here?

Mr. Ramsdell: I haven't tried that.

Prof. Hansen: It does very nicely on the prairie. It came from central Asia and is well adapted to these conditions.

Mr. Ramsdell: It ought to be a great addition to our list.

Prof. Hansen: It does finely in the southern part of the state.

The President: Any further questions?

A Member: What do you think of the Russian olives?

Mr. Ramsdell: The Russian olive is very good where it is necessary to use it. Of course, it is one of the hardiest plants, is very thorny and stiff and makes an extremely heavy hedge that will turn stock if it is closely planted. It is, however, apt to overgrow, just like the buckthorn, and if it isn't well cared for it will result in a very rough and scraggly hedge. While it is young it is practically as good as the buckthorn. (Applause.)

Some Phases of Onion Culture.

W. T. TAPLEY, INSTRUCTOR IN VEGETABLE GARDENING, DEPARTMENT OF AGRICULTURE, UNIVERSITY OF MINNESOTA.

Among the vegetable crops of the United States the onion takes its rank in third place, being below both the tomato and cabbage. In Minnesota the onion has its place with the leading vegetable crops, the money value averaging over $200,000 per year. Not only in recent years has the onion been an important crop, but for hundreds of years it has been one of the stable vegetable foods in many parts of the world. The exact place of its origin is not known, but in its early period it occupied a vast area in Western Asia, extending perhaps from Palestine to India. Among the early Egyptians it was also a very popular food. At present Vilmorin describes sixty varieties, varying in form from flat, disc, spherical, pear-shaped to long, the last form in Japan often growing a foot or more in length. Chaucer named the onion in England about 1340. In Mexico it was mentioned before 1557, in Peru before 1604, in New England, 1629, in Virginia, 1648, and it was among the Indian foods destroyed by General Sullivan in Western New York in 1779. The onion is recognized in the languages of twenty-seven countries.

In the olden times the growing of the crop was confined chiefly to the alluvial river valleys, but by improvement of varieties and careful cultural methods the onion is now grown under a diversified range of soils and climatic conditions. It is only during the last quarter of a century that a rapid growth and development of the industry has taken place in the Northern

and New England states. The past decade has witnessed the development of the Bermuda onion industry in Texas, until now we have onions on our markets supplied during the whole year, with successive crops from our own country. Nevertheless, during the past five years we have imported on an average 1,130,000 bushels per year, chiefly from Spain, Bermuda and England. England in 1915, instead of sending over the usual amount, from 200,000 to 400,000 bushels, took from us 114,990 bushels, a condition probably due to the war. The onion industry has developed most rapidly, and the demand has constantly increased. The old adage, "Keep onions in the house, and you will keep the doctor away," seems to have borne fruit, as onions are increasingly regarded as a healthful article of food. The chief states on an acre production basis are: Ohio, 6,132; New York, 5,558; Texas, 5,170; California, 4,391; Indiana, 4,048; Illinois, 3,315; Massachusetts, 2,493, and Minnesota, with 1,099, ranking about tenth.

As far as market demands go the onion is an all the year round crop, and its acreage, because of this and its wide adaptation to conditions, must increase.

The United States Department of Agriculture and the state experiment stations have done considerable research work with the onion. Over a hundred bulletins or circulars have been published on various phases of onion culture, and nearly every state in the Union is doing, or has done, some kind of investigation on the onion. Much good work has been done in testing varieties, in bringing out the importance of good seed, on the effects of irrigation, culture on muck land, intercropping, insects and diseases of the onion, etc. From the earliest times the one great foundation idea in producing onions has been to grow the crop on an extremely well prepared seed bed and to give the crop the most thorough cultivation possible. The investigational institutions and the growers themselves have not been able to change that basic direction, to prepare the soil well and keep it clean throughout the growing season.

The onion grower, or more especially the market gardener, has improved methods of growing in so far as land utilization is concerned. Among crops grown with onions as an intercrop we find celery, beans, beets, spinach and lettuce. In the New York and New England market garden center sets, or transplants, may be planted in the field from April 5th to 25th. They may

be planted the regular twelve-inch distance or two twelve-inch and then an eighteen-inch row. This gives three rows of onions and then an eighteen-inch space. In this space spinach or lettuce may be planted and harvested without injuring the onions, or this empty row is often used to grow celery plants. After the spinach or lettuce comes out, the empty row is cultivated clean until the onion leaves first begin to fall, usually from June 20th to July 10th. Beans may then be planted there, or celery plants set out. By the time the onions are pulled the beans or celery are well started in rows about three and one-half feet apart. Under a very favorable season the beans may be through yielding in time to get in a crop of fall spinach. Some growers have tried planting late beets between the rows of onions, planting two rows of beets and then leaving a row to cure the onions in. Under the most intensive systems very heavy applications of manure must be made annually. Under field conditions, where a large acreage is grown, intercropping methods are not practical, but with the market gardener intercropping methods show profitable results.

The seed is one of the most important factors in the growing of onions. The grower is indeed fortunate who (regardless of price) has purchased really first class seed. Where to obtain the best seed is a question which puzzles every grower. Nearly every seed catalog will claim that the seed it advertises is the best, or at least as good as any, but every year many growers suffer considerable loss because of poor quality seed. There are many seed houses that have every good intention of putting out first class seed, but they have nearly as much trouble finding good seed to sell to the growers as the growers have in finding a seed house that has good seed. There are two ways that losses may occur because of poor seed: First, the seed may be too old; second, the seed may have come from poorly selected bulbs. Onion seed does not retain its vitality. The Connecticut station has done much experimenting along this line and the results are tabulated as follows:

California Grown Seed.	No. samples.	Germination per cent average.
Seed stated to be less than one year old.....	400	88.18
Seed stated to be between 1 and 2 years old..	220	77.46
Seed stated to be between 2 and 3 years old..	2,023	57.34
Seed stated to be between 3 and 4 years old..	1	10.00

The loss in production from the best of old seed will be greater than the higher cost of good seed, no matter how thickly the poor seed may be sown, for not only will the germination percentage be below, but many of the germinating seeds will never get up vitality enough to produce a plant.

Again the seed may be from poorly selected bulbs. In almost any onion field all the various types or shapes may be found. Seed of a globe variety may produce globular, flattened, bottle-shaped scullions or doubles, and off colored specimens.

Field of crossed onions at University Farm.

This decreases yield and also lowers the quality of the crop. The matter of scullions (other than the fact that they are not an A No. 1 market onion) is not of considerable importance, since they usually run under 10% and because of poor quality do not perpetuate themselves to any great degree. Under Professor Wellington, at the Experiment Station, selection experiments are under way that are giving very interesting results. Probably after another season they will be ready for publication.

Because of the risk taken in purchasing seed at large, many growers prefer raising their own seed. When selecting bulbs to save for seed, choose for color, shape and size. From one bushel of bulbs three or more pounds of seed should be gathered. There are certain characteristics of onions that apply in general: for instance, large onions are usually poor keepers; the thicker the outside skin the better the shipping quality; flat

onions are earlier than globe-shaped onions of the same strain; late maturity may mean a larger crop, but a poorer keeping quality. Always avoid thick necks in saving for seed, for they represent a reversion toward the ancestral, or primitive, onion.

Onions selected for seed growing are stored over winter and planted out in the early spring in rows wide enough for horse cultivation. From 125 to 150 bushels are needed for an acre. An upland soil or a fertile loam soil should be selected rather than muck soil. The heads are gathered just before the earliest maturing seed pods shatter when handled. About three inches of stem is usually left with the head. Curing on a tight floor of a dry, airy room should be thorough. After threshing out, the light seed and waste particles should be taken out with a fanning mill or by washing in a tub, saving only the seed that sink to the bottom. A yield of 400 to 500 pounds per acre is a good crop of seed. Good seed from a selected strain has every chance to produce a crop above the average. Five pounds of seed, testing eighty per cent, or better, is enough to sow an acre.

With all the cultivated crops, the onion has its insects and diseases that may reduce the yield to a point where it ceases to be profitable. The onion maggot, thrips and the blight are the three chief pests of the onion crop. The onion maggot belongs to the order diptera, or flies, and is known wherever the onion has been grown for any length of time. The true onion maggot is the larvae of a fly and when full grown is one-fourth inch long. The adult may pass the winter in sheltered places or pupate in the ground. The adult emerges in the spring and lays her eggs, two to six, on the young plant near the surface of the ground. In about ten days the eggs hatch, and the larvae begin eating immediately, feeding within the epidermal tissue of the plant. In two weeks from hatching the maggots are ready to pupate, and the adult fly will appear in another two weeks. Two or three broods often appear during a season. The black onion fly, and the barred winged onion fly, also often attack the onion. The life histories of these is nearly the same as for the onion maggot, except that the maggots appear in storage. Fumigation with bisulphide of carbon, one pound to each 200 cubic feet of storage will check these insects.

Control measures for the onion maggot must of necessity be largely preventative measures. Practice clean culture, clean up all crop remnants and do not grow onions on land infested the

previous year. Sometimes the crop may be planted a little late, after the fly has emerged and laid its eggs, or a trap may be used. In some cases a generous application of fertilizer may add vigor to the plants. Repellants, such as sand and kerosene, one cup of kerosene to one bucket of sand; carbolized lime, white hellebore, powdered tobacco, etc., are often used, simply by scattering in the rows.

A poison bait spray for controlling the onion maggot has been used with considerable success in some localities. It should be applied from the time the onions are up until about May 20th. This spray can be made by mixing one-fifth ounce of sodium arsenite, one-half pint molasses and one gallon of water.

Even more important than the maggot is the onion thrip, also known as onion louse, and causing damage known as white blast, "silver top," or "white blight." The female by means of a tiny saw-like organ, cuts a slit in the leave or stem and deposits her eggs there. In a few days the young thrip has hatched and begins feeding. Growth is rapid. In one or two weeks they cease feeding and transform to the nymphal and then to the adult stage. Under favorable conditions in three weeks the entire life cycle will be completed. The injury is soon seen in a whitened appearance of the leaves, due to rasping and sucking the juices. Natural enemies of the thrips are the lady bird beetles and a parasite. Heavy and driving rain storms destroy great numbers of this insect. Clean methods of field culture cannot be too stringly advised, as the thrips feed on many weeds and on nearly all vegetables. A spray of nicotine sulphate may be used if the thrips have gained headway.

Cutworms, onion smut and blight are also often troublesome but can be controlled by the proper methods.

Irrigation in many sections is not generally used, although the overhead pipe systems are being used more every year. Such a system costs about $125 per acre, exclusive of a pumping plant. The cost of operation is small. An average of $15 per acre, which includes cost of water used, is a fair allowance. Results from one-fourth to twice the yield have been reported by the use of the overhead system.

There are many small details that are of considerable importance in securing an increase in crop yield, and the grower should consider all methods of improvement in planning his investment of capital. Good seed, good drainage, proper use

of fertilizers, manure and lime, supply and cost of labor, rotation of crops, proper tools, storage, and irrigation—all have their place in the list of important factors for a successful onion crop, and the growers' problem is how to properly use and combine these factors.

In Minnesota the onion will always be a leading vegetable crop. In the vicinity of the Twin Cities, which must continue to be one of the leading market garden centers of the country, an increased acreage for onions must be used to supply an increased demand. Minnesota has favorable climatic conditions for onions, a cool planting and growing season, followed by a dry, moderately warm and fairly late summer. Scattered over the state there is an abundance of muck land, such as is found in Michigan, New York, Ohio, Wisconsin, and other onion producing states. Surely this state has great opportunities in its future agriculture, and the onion has its place as a crop possibility.

Mr. Miller: In setting out onions for seed, does it make any difference if you set two kinds together? Will they cross?

Mr. Tapley: Onions generally will not cross.

Mr. Baldwin: I wish to differ with the professor in that respect. I put out white globes and red globes, both of them, and I carefully watched the seed and seeded next year, and on the red globes I had just about one-fifth white with a tinge of red on the outside of every one, and I am sure there was no seed mixed with it.

Mr. Tapley: Yes, sir, where any great quantities of varieties are planted and grown for seed, of course, that results. I thought you meant simply adjacent plots.

Mr. Miller: No, I meant for seed; would the pollen mix?

Mr. Tapley: If you had a large number mixed in the row you would be liable to get a cross.

Mr. McBroom: What about the larger onions? What is the prospect for growing the Bermudas or Spanish?

Mr. Tapley: The prospect isn't very good for growing either the Spanish or Bermuda onions in this part of the country. The south will always probably be the place where these are grown, or Texas.

Mr. McBroom: What variety gives best results in this state?

Mr. Tapley: In this state, of course, the market requires—or almost demands—a red variety, so either the Southport Red Globe or the Minnesota Red Globe or the standard red varieties generally give best results. The yield, of course, is largely not due to variety but to soil and cultural conditions, the yield of the individual variety.

Mr. Olson: What is the best remedy for the maggot?

Mr. Tapley: The onion maggot when once in the field is very hard to control. Growers have tried using sand, one bucket of sand to six fluid ounces of kerosene, simply soaking the sand in kerosene and then scattering it in the row alongside of the onion plants. Also the use of lime scattered along in the row or some nitrate of soda will sort of make the plants grow quicker and be repellant to the insect. It is a pretty difficult thing to control the onion maggot after it once gets into a field. It is very similar to the maggot which will be found in radish beds.

A Member: Can you trap the fly that lays the eggs?

Mr. Tapley: By sowing an early crop such as radishes and holding the onion crop a little late, sometimes good results can be obtained; that is, by holding the onions a little bit late and planting your radishes or cabbage, so that the fly will lay its eggs on those crops and then destroy them.

A Member: Isn't that a different maggot?

Mr. Tapley: The true cabbage maggot and the true radish maggot are different maggots from the onion maggot. But if there are no onions in the field the onion maggot must have something to feed on, and if the radish crop is planted they will usually attack that.

A Member: What I mean is, can't you poison the fly?

Mr. Tapley: It is pretty difficult to poison a fly, it is practically impossible. You mean by a spray, or something like that?

A Member: Yes.

Mr. Tapley: There is no spray that really can be applied to the onion plant, but that sand and kerosene scattered along the row is a sort of a poison.

Fall Planting.—The question has been asked several times whether it is advisable and profitable to do fall planting. Shrubs and some of the small bush fruits, such as currants and gooseberries, do very well when planted in the fall, but they should be planted as soon as it is possible to move them, which is usually soon after a good killing frost. This gives them time enough to send out little rootlets which gather enough moisture to supply the evaporation from the tops. Great care should be taken to firm the dirt well around the roots and then mulch with well rotted stable manure, using enough to cover the ground to a depth of two or three inches.

The one great trouble in planting shade or fruit trees in the fall is that they do not send out enough rootlets to gather the amount of moisture necessary to balance the evaporation, and consequently the drain is so heavy on the tree that it does not often start in the spring and if it does may die soon after starting.

Peonies and a great many other perennials may be planted in the fall but should be well protected through the winter.

Strawberries can be planted with success but the question arises as to whether it pays, as the nurserymen charge twice as much for plants set in the fall. Strawberry beds must be planted one year before bearing, and beds planted in the spring and given good care will make a good solid bed of plants before the next fall, therefore nothing is gained by planting the year before.—C. J. Telfer, Wis. Horticulture.

New Creations in Fruits.

PROF. N. E. HANSEN, STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS, BROOKINGS, SOUTH DAKOTA.

PEARS: The topic which interests me the most at present is the pear. Mr. Patten has given you a report of his splendid work in that line, and I wish him success in his efforts. The pear that I am working with happens to be another species, also from North China and eastern Siberia. Since our last meeting Dr. Alfred Rehder, of the Arnold Arboretum, has published a monograph of the oriental pears. The tree called *Pyrus Sinensis, or Pyrus Simoni*, in my bulletin 159, has since been separated by Dr. Rehder from the other Chinese and eastern Siberia pears into a new species, *Pyrus ovoidea.* This fruit tapers toward the blossom end, whereas the ordinary Chinese pear tapers toward the stem. This tree, *Pyrus ovoidea,* is a large, spreading tree with fine foliage. Its growth is strong enough for a street tree, and it is sufficiently immune to blight to form a safe foundation for our future pears. The past three seasons have been marked by the most severe invasion of blight in the history of this station. No attempt was made to cut out the affected pear, apple and crab apple trees, so these resistant pear seedlings have had every opportunity to blight, standing as they do in the same row with the blighted trees.

None of these new seedlings have borne fruit, but I deemed it best to send out some one year trees under restrictions since it is highly important to determine as soon as possible their resistance to blight under all conditions. The original trees of *Pyrus betulifolia* suffered severely from blight the past season, so that the series of hybrids with this species, N. E. H. 1-13, inclusive, will be discarded. Most of the *Pyrus ovoidea* hybrids, N. E. H. 14-39 inclusive, are still very promising, as they have proven resistant against blight the past three years. The trees are one year old buds on Japan pear and seedlings of Japan pear, Kieffer pear or French pear. My opinion at present is that the Japan pear will be the best commercial stock. This agrees with experience on the Pacific coast, where the Japan pear, which is also a form of the Chinese sand pear, *Pyrus Sinensis,* is found to be blight-resistant. My present impression is that the Japan pear stocks are not fully hardy, so the young trees will need to be carefully mulched over winter to guard against root-killing. The varying hardiness of the Japan pear seedlings as grown from im-

ported seed is no doubt due to the large area over which seed was gathered, the northern type being hardier than the southern type. The present indications are that the *Pyrus Ussuriensis,* from the Pacific coast section of Siberia, will be the coming pear stock, as the tree is absolutely hardy and very strongly resistant to blight. My experience with the Japan pear seedlings is that they make a fine growth in nursery and take buds easily. But the winter of 1915-16 was one of deep snow, so we could not give it the fair test as to whether mulching or not mulching made much difference. In my opinion, extensive orchards of *Pyrus Ussuriensis* should be established as quickly as possible, so as to raise an abundance of seed from which to grow nursery stocks.

Prof. N. E. Hansen.
From a recent photograph.

It is interesting to note that the apple or pear blight, caused by the same bacteria, is not found in Europe or Asia. It is purely an American disease, native of the northeastern United States, and is a serious menace to the apple and pear industry of the whole world. It is more destructive on the pear than on the apple. They quarantine against us in Europe so the disease will probably not get over there.

APPLES: After raising 10,000 apple seedlings I still have nothing great to offer you, but a large lot of new seedlings are coming on along new lines of pedigree. The originating of the future winter apple will probably be a step-by-step process rather than a single stride. I was much interested in the past season in a lot of new hybrid crab apples. One of the best was a union of the Cherry crab type with the Duchess apple, which bore a very heavy crop. Many hybrid crabs that have appeared in the past

are not sufficiently productive. I do not yet know what is the best combination.

PLUMS: The largest of my 10,000 plum seedlings is my Waneta, a 2 inch, 2 ounce plum, which set the fifth successive crop this year, although the trees have been cut back very severely for scions and bud sticks. The Waneta is very strong in nursery, Mr. D. B. Gurney, Yankton, South Dakota, had one grow ten feet from bud in nursery.

Some years ago I obtained some wild plums (*Prunus nigra*) collected by Thomas Frankland near Stonewall, Manitoba, and out of many seedlings two were selected and propagated under the names Winnipeg and Assiniboine, as noted in my Bulletin 130. These have been tested at various places at the North, especially in their native region, and have won favor. Here at Brookings the Manitoba plums are characterized by small size of tree, but extremely early season of fruit. In fact, they are the earliest of all the native plums, but are not needed for the main market here, since at Brookings we can raise larger and better plums owing to our later season.

In the endeavor to improve the fruit in size and quality I have made a number of hybrids of the Manitoba wild plum with choice plums from California. None of these hybrids are as large as Waneta, so it will probably be planted mainly at the North. The trees are productive, and the large red fruit is of excellent quality. The names are all of Indian tribes of the far North, especially Manitoba.

OJIBWA PLUM: Pedigree: Shiro x Manitoba wild plum pollen. Since the Shiro, one of Luther Burbank's plums, is a complex hybrid of four species, the Ojibwa will be a mixture of five different species of Prunus: *Nigra, Angustifolia, Cerasifera, Triflora, Simoni.*

CREE PLUM: Pedigree: Manitoba wild plum x Combination plum pollen. When introduced in 1901 by Luther Burbank the Combination was considered the best in quality of 25,000 seedlings.

PEMBINA PLUM: Pedigrees: Manitoba wild plum x Red June plum pollen. The Red June is one of the earliest and best plums, imported many years ago from Japan.

The Ojibwa, Cree and Pembina were introduced in spring of 1917.

LATE PLUMS FOR THE SOUTH: We have raised many seedlings of the Sand plum of Kansas, *Prunus Watsoni.* They are

interesting trees of dwarf habit bearing profusely of good fruit which varies greatly in size and quality. Two of my hybrids with the Wolf plum are now offered as being worthy of trial in the south, since they ripen after all other plums are gone but yet early enough to escape frost year after year. I judge these new plums should not go much north of Brookings, as they may not ripen. But for the southern part of the state they are worthy of trial as a distinct new departure in plums. The names are given in honor of old Indian tribes in the Sand plum region.

KIOWA PLUM: Offered for the first time. Pedigree: Prunus Watsoni x Wolf plum pollen. The color is a pleasing bright dark

Kaw plum.

red with firm skin with fine white dots and white bloom and peculiar crisp texture of yellow flesh. The quality is pleasing to all who have tried it.

KAW PLUM: Offered for the first time. Pedigree: Prunus Watsoni x Wolf plum pollen.

The Kaw and Kiowa were introduced in spring of 1917.

THE MOSCOW CHERRY: The prairie Northwest greatly needs a hardy cherry. In the course of my five tours to Russia I became greatly interested in the cherry grown in the Vladimir region of Russia just east of Moscow. The fruit comes to the markets of Moscow in immense quantities. Near Moscow, on the Sparrow Hills, where Napoleon stood in 1812, there are some interesting orchards of these cherries which I visited in 1894 and 1897. These cherries are grown mostly from root sprouts and seeds. The type, however, is not as constant as was thought at first but varies considerably. Out of a lot of my imported seedlings I have selected one and named it Moscow, which were sent

out in spring of 1917 for the first time as budded trees, as it would take too many years to work up a stock of the cherry on its own roots. The trees are one year buds on Mahaleb roots. This means that at the North they must be mulched carefully to prevent root-killing. As soon as possible, the Northern native Pin cherry should be tested as a budding stock. Out of a large number of cherries tested at this Station, Moscow is the only one that has borne fruit in satisfactory quantities. The tree is productive and perfectly hardy. The fruit is of medium size, bright red with light colored juice of good quality.

I came through St. Paul this fall and went to the fruit market and got some big, black-juiced California cherries, at 30 cents

Ojibwa plum.

a pound. They were certainly very fine. I took them home and compared them with a lot of my sand cherry hybrids spread over two tables in the laboratory. During several days they were tested by many people, and the consensus of opinion was that my black juiced sand cherry hybrids of the Sapa type were just as good. So we have a black-juiced fruit now that will compare favorably with the black-fleshed cherries from California.

GOOSEBERRIES: I began work with the native gooseberry of South Dakota when I first came to South Dakota in September, 1895. Since then I have carried the wild gooseberry of the Sioux Valley through six generations by selection. The past season afforded an excellent chance for selecting the best forms for use in raising the seventh generation. The best ones were considerable larger than the Houghton. In addition, I have made a number of hybrids of the large European with this South Dakota gooseberry. Some of these bore the past season and are very promising. They certainly have size, but I do not know whether the white pine rust will spoil all our work with the gooseberries and currants or not. But I do not believe this will be

the case for South Dakota, since the white pine is not adapted to the open prairie.

IN GENERAL: Some claim that we must stick to native plants only. I have no national feeling about these things at all. I take a good plant wherever I can find it, whether it is Russia or India or China or Japan, or out here in our own woods or in the sand hills of the Bad Lands of the far West. The main thing is to get it and then bring this material together and apply the laws of plant-breeding. It is up to you to do that and then watch for the result. The idea that we must use only native plants is a mistaken notion. It is not a political question, it is a plant question. Get the plant material of the whole world together and from that material evolve the fruit we want. I want to say that Siberian material, in many respects, is the most promising material we can get. The absolute hardiness is there, and if it is from the right part of Siberia the climatic conditions are very much the same as ours.

I call your attention to the fact that most of this fruit-breeding is done by my orchard house method, which I have been developing during the past twenty years and which has since been followed by others. The orchard house method for raising the fruit under glass is really a movable orchard. The trees are grown in tubs and pails and may be stored in cellar over winter and later out doors. During the blossoming period the trees are in the greenhouse.

In conclusion, some of the minor fruits I have passed over at the present time. In all our work we need now to strike out on new lines. Every amateur who has a little land and a love for the work can aid greatly. Some of the best varieties we have in fruits, vegetables and flowers have come through the efforts of amateurs. By the law of chance the only hope for advance along many lines comes from immense numbers of seedlings. We must all help in this work. (Applause.)

CUCUMBER BEETLES.—The cucumber beetle causes serious damage to cucumbers, melons, squashes and other cucurbits. The most of the injury is accomplished just as the plants are breaking through the ground and, unless remedies are applied, entire plantings may be destroyed in a few hours. The beetle winters over in rubbish and all such should be gathered and burned on fields known to be infected, so as to destroy the insect in its hibernating quarters. Prevention is easier than a cure; hence, early plantings, starting plants under glass, covering hills with wire cloth or like devices, until plants are large enough to be beyond the danger point. Spraying with Bordeaux mixture is a valuable repellent and adding arsenate of lead will destroy many beetles. Lime, sulphur and tobacco dust also act as repellents. Severe injury may be outgrown by forcing the growth by liberal use of manure and fertilizers.—S. N. Green, "Market Growers' Journal."

Notes from an Entomologist's Garden.

PROF. F. L. WASHBURN, UNIVERSITY FARM, ST. PAUL.

The following notes may be of interest to readers of our Horticultural Magazine:

1. *Top Worked Apples.* Scions of Delicious, Jonathan, King David and Grimes' Golden, top-worked on Hibernal and Patten's Greening in our garden came through the severe winter of 1916-17 in excellent shape, which is quite encouraging to those who would raise the less hardy varieties of apples here, but have hesitated because of predictions that a severe winter would be fatal.

2. *Plums.* Nearly all trees, including Hansen Hybrids, were full of bloom, but owing to cold rain or severe weather when ready for pollenization our trees set but little fruit. Two trees, said to be Silver Prunes on hardy roots, received from Mr. Arrowood, of Nevis, have made a fine, vigorous growth, exhibiting a little bloom last spring but setting no fruit. Haralson's plums from the University Fruit Farm, Nos. 9, 21, and 12 have made fine, luxuriant growth, but set no fruit, although No. 9 did for a time have fruit, all of which dropped very early in the season. Both Nos. 9 and 21 were full of bloom. The extremely stocky top growth of No. 21 was particularly noticeable. A nurseryman who secured fruit from No. 12 this year is most enthusiastic in its praise.

3. *Melons.* Of melons, Kellogg's Heart of Gold and Yellow Meated Japan did fairly well. We raised a few Siberian melons from seed obtained from Professor Hansen, but the few maturing did not impress us favorably as to quality. This may have been due to our soil, or some other conditions in connection with cultivation or with this particular season.

We again, as in two previous years, kept the larvae of the striped cucumber beetle "at bay" by the use of a weak solution of Black Leaf 40, poured about the roots. This also acted as a strong stimulant to the vines, and the adults, as we all know, are not at all partial to air-slaked lime dusted on and about the young plants.

4. *Loganberries.* We have succeeded for two successive years in raising a few Loganberries to ripe stage. The birds, we regret to say, took advantage of us in this connection. Vines are buried each fall about ten inches. It would appear perfectly possible to raise a little of this fruit here for family use.

5. *Grapes.* It has apparently been a strikingly good year for grapes and currants. Moore's Diamond ripened well with us,

and we were, therefore, encouraged to purchase more vines of this delicious variety.

6. *Potatoes.* The soil in our garden at Minnetonka, like in many other localities in that region, is a medium heavy clay loam, and this year we were desirous to see what varieties of potatoes would do the best under these conditions. We planted Irish Cobbler, Early Ohio, Burbank, Rural New Yorker, Green Mountain and Burbank Russet. All seed was treated with formaldehyde before planting. A fairly good yield, both as regards number in a hill and size of tubers, was obtained from the first five varieties. The Green Mountain potatoes, however, tho large, were badly cracked. The Burbank Russet gave most gratifying results, each hill averaging from six to eight and a surprisingly large number of big tubers. The particularly noticeable feature in connection with the Russets was the fact that there was no blemish of any kind on the tubers. They were perfect shape and absolutely free from any disease. It would appear that this is the potato "par excellence" for the clay loam at Lake Minnetonka. The Irish Cobbler did not appreciably lead in early ripening over the Early Ohio. A party at Excelsior has been raising a variety locally known as Six Weeks potatoes (possibly a sport from Early Ohio) which anticipates in ripening the latter variety by three weeks.

Hansen's Siberian melon.

All potatoes in our garden were absolutely free from potato beetle injury. Two, or at the most, four beetles, which were observed by the writer early in the season, were immediately destroyed. The unusual freedom from this pest may have been due to the presence of a number of rose-breasted grosbeaks, which eat this insect, but in this instance, as in other years, took their pay later by attacking the green peas. The potato flea beetle was kept well in check by occasional dusting of the plants with air-slaked lime mixed with paris green.

My Prize Orchard and How I Manage It.

E. W. MAYMAN, SAUK RAPIDS.

The management of a "Prize Orchard" is not materially different perhaps from the management of any other orchard, except we naturally try to take better care of it in the hope that we may grow better trees, raise better fruit and capture the highest prize we can.

The land in my vicinity is somewhat rolling upland and the surface soil a clay loam underlaid with a compact strata of hardpan, which if not loosened up has a tendency to retard and check the root system by locking up the circulation and holding back the fertility.

In a dry spring digging holes with a spade or long handled shovel is laborious work, hence I use the dynamite system. We make a hole where the tree is to be planted with a crowbar, putting it down about three feet. Then we take a half pound stick of forty per cent. red cross dynamite and cut it in two, using one-fourth pound to each hole, and with a fuse about three feet long attach it with a cap to the dynamite and place it in the hole, leaving the fuse about two inches above the surface in order to light the same.

All the holes are charged before setting off, after which the work of cleaning out and preparing to plant the trees is easy. Care should be taken to see that all the pockets and cavities are closed, and this is done by tamping with a long handled shovel.

This dynamiting shatters and blows the hardpan apart, and the ground can be seen to heave for several feet around.

The hole is then filled with enough good black surface soil so the tree can be planted the required depth. I plant about two inches deeper than it formerly stood if a three years old tree, and about the same depth it stood in the nursery if a two years old tree.

Shading should be done as soon as planted to prevent blistering and sunscalding, as the bark on the trunk is tender after being shaded by other trees in the nursery row. I use the wooden veneer protector and buy them by the thousand. They are put on at planting time and remain on until they decay, and if removed otherwise they are replaced. They are also a protection against mice and rabbits.

As to pruning, the roots are pruned if necessary, also a few side shoots removed and about one-half of the previous season's growth. The balance, and main, pruning is done later in the season after the tree has begun to establish itself. I have found that in pruning the branches along the trunk at planting time when the trees are in a dormant state, that the wound does not heal as well as when done later when the tree shows signs of life.

Cropping the orchard is not detrimental to its success. A liberal use of manure or other fertilizer and cropping with strawberries, followed by potatoes, is what I practice. For a mulch in the line or row of trees, I use rape seed and leave it there. It makes a good mulch and also prevents the snow from blowing away.

PROGRAM 51st ANNUAL MEETING

Minnesota State Horticultural Society,

To be held in the West Hotel, Minneapolis, December 4, 5, 6, 7, 1917.

A Great Program.

Study this program carefully and select such features as you especially desire to participate in—but you are more than welcome to all.

Discussion follows each topic, and is "free for all," whether members or not. Ask questions or express opinions freely.

DEMONSTRATIONS.

These demonstrations will be given between 1:00 and 1:45 each day of the meeting in rooms adjoining the hall in which the meeting is held. They will be conducted by those whose names are here given, all of whom are connected with University Farm.

Grafting, Fred Haralson, Hort. Foreman.
Pruning, Frank Daniels, Instructor in Hort.
Food Conservation, Miss Elizabeth Nickerson.

All participants on this program are limited to fifteen minutes except where a longer period is specifically mentioned.

Time for discussion is allowed after each number.

At the close of each session of the meeting those who have taken part in the program of that session are requested to come to the president's desk for a few moments immediately following the close of the session to meet any members who may desire to talk with them about the subjects they presented.

NOTICE OF BEE-KEEPERS' MEETING.

The Minnesota State Bee-Keepers' Association will hold its annual meeting in the "Moorish Room," West Hotel, Minneapolis, on Tuesday and Wednesday, December 4 and 5, 1917. A good representation of expert bee-keepers from abroad and Minnesota promises a very fine meeting. Program can be had of L. V. France, University Farm, St. Paul.

NOTICE.—A bell will be rung in the adjoining hallway five minutes before the exercises begin in the Audience Room.

☞Persons entering the audience room when any one is addressing the meeting from the platform are requested to take seats in the rear of the room, going forward only after the speaker has concluded—and thus avoid much confusion.

TUESDAY MORNING SESSION.

10:00 o'clock.

Every member attending should not fail to be in his seat promptly when this session opens.

Invocation.....Rev. H. A. Risser, Hopkins
Song.....Mr. Trafford N. Jayne, Minneapolis
President's Annual Greeting.....
Thos. E. Cashman, Owatonna

1. My War Garden.
   Clarence Wedge, Nurseryman, Albert Lea.
2. A New Departure in Marketing Small Fruits.
   F. E. Cutting, Nurseryman, Byron.
3. Public Safety Marketing Plan.
   Hugh J. Hughes, Editor Farm, Stock & Home, Minneapolis.
4. The Value of Experiment Work.
   R. W. Thatcher, Dean, Minnesota College of Agriculture, St. Paul.
5. Bud Variation a Practical Asset in Horticulture.
   Prof. M. J. Dorsey, University Farm, St. Paul.

Appointment of committees on award of premiums.

TUESDAY AFTERNOON SESSION.

1:30 o'clock.

Discuss each paper.

A half hour "Question and Answer Exercise" on "Spraying the Orchard and Garden," led by Prof. A. G. Ruggles, University Farm.

2 o'clock.

MUSIC.

President Cashman in the Chair.

Reception of Delegates.

FRUITS.

1. Canker Troubles.
   Prof. E. C. Stakman, U. Farm, St. Paul.
2. Plum Pocket and Brown Rot of Plums.
   Prof. G. R. Hoerner, U. Farm, St. Paul.
3. Twenty Years With a Spraying Outfit.
   Carl Stellar, Excelsior.
4. Growing Raspberries at Lake Minnetonka.
   Ed. J. Justin, Fruit Grower, Excelsior.
5. My Irrigation Plant.
   J. P. Johanson, Excelsior.
6. The Apple—Advertise It.
   E. A. Smith, Lake City.
7. Interesting Young People in Horticulture.
   S. H. Drum, Owatonna.

Contestants, Gideon Memorial Fund.

By Students at University Farm.

To conclude with a Lantern Talk, "Tree Planting on the Farm," by Prof. J. P. Wentling, Forestry Department, University Farm, St. Paul.

Are there any good seedling apples, etc., in your neighborhood? Get them and the owner of the trees to the annual meeting. Do your neighbors a favor by urging them to attend.

TUESDAY EVENING SESSION.

8:00 o'clock.

MINNESOTA STATE FLORISTS' SOCIETY.

Hans Rosacker, Minneapolis, Pres., in the Chair.

Some Good House Plants and Their Care, W. E. Tricker, St. Paul.

Hardy Perennials for the Home, C. A. Mathes, St. Paul.

Care of Trees, illustrated with lantern slides, I. N. Johnson, Minneapolis.

MEMBERSHIP OF THE MINNESOTA STATE HORTICULTURAL SOCIETY FOR 1917.

Annual	3195
Life	409
	3604

Members are entitled to the use of the Society Library. For terms, see page 511, Society Report for 1916.

Are you a member of the Garden Flower Society? If you are growing flowers you should be. Consult the secretary, Mrs. M. L. Countryman, 213 So. Avon, St. Paul.

WEDNESDAY FORENOON SESSION.

9:00 o'clock.

Discuss Each Topic Freely.

A half hour question and answer exercise on **"Vegetable Growing in Minnesota,"** led by Alfred G. Perkins, St. Paul.

9:30 o'clock.

Frank H. Gibbs, Pres. Minn. Vegetable Growers' Society, presiding.

The Vegetable Garden.

1. Desirable Vegetable Varieties for Planting and Their Variations under Different Soil Conditions.
   C. J. Lindholm, Minneapolis.
2. Squash Growing, Storing and Marketing.
   Frank Dunning, Anoka.
3. Melon Growing and Marketing.
   J. Vincent Bailey, W. St. Paul.
4. Vegetable Diseases and Their Remedies.
   Dr. E. C. Stakman, University Farm, St. Paul.
5. Newer Things for the Vegetable Garden.
   H. J. Baldwin, Northfield.
6. Seed Potatoes and Potato Diseases.
   Prof. G. R. Bisbee, University Farm, St. Paul.
7. Growing and Marketing the Tomato.
   N. A. Rasmussen, Pres. Wisconsin State Hort. Society, Oshkosh, Wis.
8. Use of Commercial Fertilizers for Vegetables.
   Dr. F. J. Alway, University Farm, St. Paul.
9. Things of Interest Seen and Heard at the National Vegetable Convention.
   Frank L. Gerten, County Agent, St. Paul.

You can become a life member of the State Horticultural Society by payment of $10.00, in two annual payments of $5.00 each if you prefer. This will entitle you to a file of our bound reports, a library in itself.

WEDNESDAY AFTERNOON SESSION.

1:30 o'clock.

Discussions Open To Everybody.

The Question and Answer Exercise to occupy this half-hour will be on **"The Minnesota Plum Grove,"** led by Dewain Cook, Jeffers.

2:00 o'clock.

President Cashman in the Chair.

1. Definition of Hardiness and Its Application.
   Prof. M. J. Dorsey, University Farm, St. Paul.
2. Plums and Apples Hardy in the Canadian Northwest.
   Prof. F. W. Broderick, Agricultural College, Winnipeg.
3. Mistakes Leading to Success.
   S. D. Richardson, Winnebago.
4. The White Willow a Valuable Asset for the Minnesota Planter.
   H. J. Ludlow, Worthington.

3:15 o'clock.

The **annual business meeting** of the Minnesota Garden Flower Society will be held Wednesday morning at 10:00 o'clock in an adjoining room.

MINN. GARDEN FLOWER SOCIETY.

Mrs. E. W. Gould, Pres., Minneapolis.

Music.

1. Fragrant Peonies.
   Chas. J. Traxler, Pres. N. W. Peony & Iris Society, Minneapolis.
2. Plant Improvement by Selection.
   Wm. Toole, Delegate Wis. State Hort. Society, Baraboo, Wis.
3. Possibilities of the Single Peony for Private Grounds.
   Mrs. N. S. Sawyer, Excelsior.
4. Gardening for Children Under School Supervision.
   Sherman Dickinson, Agricultural Instructor, Minneapolis Central High School.

Music.

5. Preserving the Natural Landscape Spirit in Artificial Plantations.
   Prof. C. B. Waldron, Agricultural College, N. D.
6. Shrubs and Hardy Herbaceous Perennials of Manitoba.
   An illustrated address by Prof. F. W. Broderick, Winnipeg.

Demonstration in conservation of fruits and vegetables, by State Champion Canning Club.

WEDNESDAY EVENING SESSION.

N. W. PEONY AND IRIS SOCIETY.

8:00 o'clock.

At this hour a business meeting of this society will be held, followed by a practical and attractive program.

THURSDAY FORENOON SESSION.

9:00 o'clock.

Have You a Banquet Ticket?

A thirty-minute "Question and Answer" exercise on **"The Indispensable Shelter Belt,"** led by John W. Maher, Devils Lake, N. D.

9:30 o'clock.

President Cashman in the Chair.

Report of Committee on Fruit List.
J. P. Andrews, G. W. Strand, T. E. Cashman.
Adoption of Fruit List.
Report of Executive Board, J. M. Underwood, Chairman, Lake City.
Report of Secretary, A. W. Latham.
Report of Treasurer, Geo. W. Strand, Taylors Falls.

The annual reports of the vice-presidents, superintendents of Trial Stations and Auxiliary Societies, **will be filed** with the secretary for publication **without reading.** (See list on page 20.)

1. Tree Planting Along Arterial Highways.
   Three five-minute talks—
   M. O. Nelson, Minneapolis.
   I. M. Johnson, Minnesota Reclamation League.
   Mrs. Wm. F. Drews, President Woman's Improvement League, Hopkins.
2. Results of Orchard Spraying Demonstrations in Iowa. (30 minutes.)
   Prof. R. S. Herrick, Hort. Specialist, Ames, Ia.
3. Preventing Winter Injury to Fruit Trees. (30 minutes.)
   Prof. J. C. Whitten, Horticulturist, Columbia, Mo.

11 o'clock.

T. A. Erickson, State Club Leader, Presiding.

"My Liberty Garden" stories by five state champion "Garden and Canning Club" members.

THURSDAY AFTERNOON SESSION.

1:30 o'clock.

Discuss These Subjects.

"Trees for Street, for Shelter and for the Lawn" will be the subject of the half-hour "Question and Answer Exercise," led by Geo. H. Whiting, Nurseryman, Yankton, S. D.

2:00 o'clock.

President Cashman in the Chair.

1. The Mission of the Minnesota State Horticultural Society.
   S. P. Crosby, St. Paul.
2. Minnesota As a Horticultural State.
   Prof. R. S. Mackintosh, University Farm, St. Paul.
3. Minnesota As the Originator of New Fruits.
   Roy D. Underwood, Lake City.

Music.

3:00 P. M.

4. Address.
   Dr. Marion L. Burton, Pres. University of Minnesota.

Annual Election of Officers.

3:30 o'clock.

Conservation.

1. Food Administration.
   A. D. Wilson, Director Federal Food Administration, St. Paul.
2. Uncle Sam at the Head of the Table.
   Mrs. T. G. Winter, Chairman Women's Auxiliary, Minn. Division National Council of Defense.
3. Food Conservation in the Home.
   Miss Mildred Weigley, Acting Chief Division of Home Economics, University Farm, St. Paul.
4. Value of Fruit and Vegetables in the Diet.
   Miss Elizabeth Nickerson, Emergency Home Demonstration Agent, Minneapolis.
5. Use of Fruits and Vegetables to Save Meat and Wheat.
   Miss Elizabeth Lange, State Leader Home Economics Demonstration Agents.
6. Liberty Gardens.
   R. S. Mackintosh, Hort. Specialist, University Farm, St. Paul.
7. Planting Home Grounds.
   Illustrated by lantern views, an address by Prof. J. C. Whitten, Horticulturist, Columbia, Mo.

We go directly from the hall to our annual banquet at 6:30 p. m.

FRIDAY FORENOON SESSION.

9:00 o'clock.

A thirty-minute "Question and Answer Exercise" on **"How To Breed New Fruits,"** led by Prof. N. E. Hansen, Brookings, S. D.

9:30 o'clock.

President in the Chair.

1. Trimming Apple Trees.
   Gust Johnson, Minneapolis.
2. Regulating the Bearing Habit of Fruit Trees. (30 minutes.)
   Prof. J. C. Whitten, Horticulturist, Columbia, Mo.
3. How the Strawberry Sets Fruit.
   W. D. Valleau, Assistant Fruit Breeding, University Farm, St. Paul.

Music.

Plant Breeders' Auxiliary.

Clarence Wedge, President, in the Chair.

1. Annual Report, 1917, Minn. Fruit Breeding Farm.
   Chas. Haralson, Supt., Excelsior.
2. Report of Committee on Fruit Breeding Farm.
   F. W. Kimball, Waltham.
   G. A. Anderson, Renville.
3. Some Landmarks of Plant Breeding. (20 minutes.)
   Prof. L. R. Waldron, Agricultural College, N. D.
4. Relative Value of Native and Foreign Species in Breeding New Fruits.
   Prof. N. E. Hansen, Brookings, S. D.
5. Some of Our New Fruits.
   A. Brackett, Excelsior.
6. What I saw at the Fruit Breeding Farm.
   Geo. J. Kellogg (now of Minneapolis).
7. Developments in Fruit Breeding the Past Year.
   Chas. G. Patten, Charles City, Ia.

FRIDAY AFTERNOON.

1:30 o'clock.

The "Question and Answer" half-hour will be occupied with this subject, **"The Top-Worked Fruit Tree,"** led by Henry Dunsmore, Nurseryman, Olivia.

2:00 o'clock.

Music.

1. How I Grow Apples.
   D. C. Webster, La Crescent.
2. Care and Management of the Home Orchard. (30 minutes.)
   Prof. R. S. Herrick, Horticultural Specialist, Ames, Ia.
3. Top-Working for One-Quarter Century.
   F. W. Kimball, Austin.
4. Varieties for the Minnesota Orchard.
   Prof. Richard Wellington, Assistant Horticulturist, University Farm, St. Paul.

4:00 o'clock.

Two-minute speeches by members.

4:30 o'clock.

Closing remarks by the President.

Chinking Column.

These papers may be called for at any time during the meeting convenient to the writer.

1. Blackberry Growing and Its Difficulties.
   Albert Durand, Waseca.
2. Personal Recollections of the Originator of the Wealthy.
   Rolla Stubbs, Bederwood.
3. The Everbearing Strawberry in 1917.
   Chas. F. Gardner, Osage, Ia.
4. The Most Profitable Varieties of Apples and Crabs for the Northwest and Marketing of Same to Secure Best Results.
   D. B. Gurney, Nurseryman, Yankton, S. D.

PREMIUM LIST, ANNUAL MEETING, 1916.

Thos. Redpath, General Supt.

Geo. W. Strand, Clerk.

All entries must be made with the Secretary at least **one week before** the date of the annual meeting, and blanks may be secured of the Secretary for this purpose.

All exhibits **must be in place by 10:00 o'clock a. m.** of the first day of the meeting to be entitled to compete for premiums, except as noted.

Exhibitors competing must be members of this society and growers of the articles exhibited.

All bulky exhibits must be brought in through the rear entrance to the hotel and by elevator to the second floor, where the exhibition is to be held.

Exhibits will be open to visitors Tuesday and Wednesday evenings until 10:00 o'clock.

PREMIUM LIST—Continued.

FLORAL DISPLAY.

W. H. Bofferding, 710 No. 2nd St., Minneapolis, Supt.

PLANTS.

To Be Staged Monday P. M., Dec. 3, 1917.

	1st.	2nd.	3rd.
Collection of 12 specimen Palms	$10.00	$7.00	$4.00
Collection of 12 specimen Ferns	10.00	7.00	4.00
Collection of 12 specimen Blooming Plants (Covering 25 square feet.)	12.00	9.00	6.00

VEGETABLES.

Exhibits To Be Set Up Monday P. M., December 3, 1917.

N. H. Reeves, Minneapolis, Supt.

	1st.	2nd.	3rd.	4th.
Beets, 1 peck	$2.50	$1.50	$1.00	$0.50
Cabbages, 3 head	2.50	1.50	1.00	.50
Carrots, 1 peck	2.50	1.50	1.00	.50
Celery, 1 doz. stalks	2.50	1.50	1.00	.50
Celeriac, 1 doz. roots	2.50	1.50	1.00	.50
Lettuce, 1 doz. heads	2.50	1.50	1.00	.50
Onions, 1 peck Red	2.50	1.50	1.00	.50
Onions, 1 peck White	2.50	1.50	1.00	.50
Onions, 1 peck Yellow	2.50	1.50	1.00	.50
Onions, 1 peck White Pickling	2.50	1.50	1.00	.50
Parsley, 1 doz. b'ches	2.50	1.50	1.00	.50
Parsnips, ½ bushel	2.50	1.50	1.00	.50
Potatoes, Early Ohio, 1 bu.	2.50	1.50	1.00	.50
Potatoes, Rural type, 1 bu.	2.50	1.50	1.00	.50
Potatoes, Triumph, 1 bu.	2.50	1.50	1.00	.50
Potatoes, Burbank, 1 bu.	2.50	1.50	1.00	.50
Pie Pumpkins, three specimens	2.50	1.50	1.00	.50
Radish, fresh, 1 doz. bunches	2.50	1.50	1.00	.50
Salisfy, one dozen bunches	2.50	1.50	1.50	.50
Hubbard Squash, three specimens	2.50	1.50	1.00	.50
White Turnips, 1 peck	2.50	1.50	1.00	.50
Rutabagas, ½ bu.	2.50	1.50	1.00	.50

PREMIUM LIST—Continued.

SEEDLING APPLES.

Four specimens (not less than 2½ inches in diameter) must be furnished of each variety exhibited.

Entries of seedling apples can be made only by owner of the original tree or his sole authorized agent. Competition is open to all except on such varieties as are being propagated for sale by some person other than the originator.

Competition in seedling apples is open also to the western half of Wisconsin, the northern third of Iowa, and all of North Dakota, South Dakota and Manitoba.

Premiums will be divided pro rata among the entries scoring 60 or upwards.

Before payment of premiums awarded on seedling apples, a history and description of the tree and its fruit may be required. Blanks with suitable questions will be furnished for this purpose.

N. B.—The judges will, at their discretion, change entries of seedling apples from either class to the other.

EARLY WINTER SEEDLING—The fruit shown must not have been kept in cold storage. Premium $40.00, to be divided pro rata.

LATE WINTER SEEDLING—Same conditions as for early winter seedling except that if found necessary the fruit shown may be retained and final decision reserved until later in the winter. Premium $60.00 to be divided pro rata.

In each of the above two classes the varieties receiving the three highest awards will be designated as having received first, second and third premium, respectively.

APPLES (not including crabs).

No inferior fruit can be shown.

	1st.	2nd.	3rd.
Each variety (may or may not have been in cold storage) included in the 1917 fruit list of the society, or in the 1917 premium list of the Minnesota State Fair	$0.75	$0.50	$0.25
Collection, not to exceed ten nor less than six varieties	$20.00 to be divided pro rata		

PREMIUM LIST—Continued.

Top-Worked Apples.

Collection of named varieties grown on scions top-grafted on other trees. Accompanying the name of each variety, shown on the same label (to be furnished by the management), must be noted the name of the variety on which it is top-worked. $40.00 to be divided pro rata.

Pecks of Apples.

Peck of any variety of apples, the fruit exhibited to be at the disposal of the society. An exhibitor may enter a peck each of as many different kinds as he pleases. $40.00 to be divided pro rata.

BOXES AND BARRELS OF APPLES.

Must have been packed by the exhibitor.

Only one variety (not less than 2¾ in. in diameter) can be shown in a box. Bushel boxes of the standard size must be used. Awards will be based on the quality of the fruit, packing, etc.

Box of any variety of apples, including seedlings. An exhibitor may enter a box each of as many different varieties as he pleases. $50.00 to be divided pro rata. Also 1st $10.00, 2nd $5.00, but no single exhibitor can take both of these two prizes.

	1st.	2nd.	3rd.
Barrel of apples, any variety (only one entry by any one exhibitor). $40.00 to be divided pro rata. Also	$15.00	$10.00	$5.00

$100 SEEDLING APPLE PRIZE.

The sixth prize of $100.00 will be awarded this season "for the best late winter seedling apple keeping till March 1st under ordinary cellar conditions" under the offer made first in 1905, restricted, of course, to the contestants who have duly registered.

NUTS.

	1st.	2nd.	3rd.	4th.
Each variety of edible nuts, one qt	$1.00	$0.75	$0.50	$0.25

CANNED AND DRIED FRUITS AND VEGETABLES.

Collection of canned fruits and vegetables (either or both) in quart glass jars. $40.00 to be divided pro rata.

	1st.	2nd.	3rd.
Collection of dried fruits	$3.00	$2.00	$1.00

N. W. PEONY AND IRIS SOCIETY.

W. F. CHRISTMAN, Secretary.
3804 Fifth Avenue South, Minneapolis. Minn.

In the last issue of the Horticulturist we gave our readers a list of something over one hundred desirable peonies. We take pleasure in presenting this month a list of fifty standard irises that have been selected and named by a majority of the iris growers of very fine irises, and this list will doubtless be enlarged to embrace varieties of merit. The list given below will be found to cover a broad field, and it has been grouped in classes to make it easy for the amateur to choose readily the class to meet his requirements. The Japanese irises, while very beautiful, have not been listed for the reason that they have not proven entirely satisfactory in all sections of the country. After it has been fully determined the varieties best suited to meet all requirements, descriptions will be printed in bulletin form and distributed to our members, both of the peony and iris. These descriptions will be brief and as authentic as possible to make them. A splendid variety named Zua the writer has found very desirable.

I would appreciate receiving a list of peonies or irises, or both, from any of our amateur members who are growing a number of varieties. Would also appreciate receiving photos of your garden, or of indivdual or collective groups of peonies or irises. Send in these photos, and we will have them printed and show others what you are accomplishing.

IRISES.

Dwarf.—Cyanea, Formosa, Stewart.

Intermediate.—Dorothea, Halfdan, Helge, Ingeborg, Walhalla.

Germanica, Tall Bearded.—Alcazar, Albert Victor, Archeveque, Aurea, Black Knight, Caterina, Crimson King, Crusader, Darius, Dr. Bernice, Eldorado, Fairy, Her Majesty, Iris King, Isoline, Juniata, Jacquesima, Kharput, Kochii, Leonicas, Lohengrin, Lorelei, Madam Chereau, Mithras, Monsignor, Mrs. Allan Grey, Mrs. H. Darwin, Mrs. Neubronner, Miss Eardley, Nuee d'Orage, Oriflamme, Ossian, Pallida Dalmatica, Perfection, Princess Victoria Louise, Prosper Langier, Rhein Nixe, Trautlieb, Trojana Superba, Windham.

Beardless Irises.—Monniere, Orientalis.

Our mid-winter meeting will be held at the West Hotel, Minneapolis, evening of December 5th, in conjunction with the Horticultural Meeting. We anticipate an interesting and instructive gathering and will be glad to meet all our members who can attend. Let's make this a real, live, hustling meeting, that will be the means of accomplishing good results.

Election of officers will be held for coming year at our evening meeting Wednesday, December 5th. If you can not be present vote by proxy, sending same to me as early as possible before the meeting.

BEE-KEEPER'S COLUMN.

Conducted by Francis Jager, Professor of Apiculture, University Farm, St. Paul.

WINTERING BEES IN THE CELLAR.

A. W. RANKIN, 916 S. E. 5TH ST., MINNEAPOLIS, PRESIDENT MINNESOTA BEE-KEEPERS' ASSOCIATION.

An expert may winter bees in the open in Minnesota. This method is attended with greater risk, greater expense for packing, and greater consumption of stores by the bees. If successful it probably brings the bees through the spring season with greater vigor on the part of the bees in building up for the summer honey flow. Outdoor wintering is not recommended for general practice in Minnesota. The essentials of cellar wintering are: (1) a good condition of swarm when it is carried into winter quarters. This involves plenty of bees, and stores. If bees are to be left in an eight or a ten-frame hive there should be at least five frames of bees for the eight-frame hive and six for the ten-frame hive. Three or four frames of bees may be wintered, but the space in the hive should be contracted to about a four frame size. Stores may be either honey or sugar syrup, but there is a growing opinion that good ripened honey is the best food for wintering. If sugar, then twenty per cent. more is needed. Perhaps three and one-half pounds of honey for each frame of bees is a fair average, but a small number of bees takes more honey proportionately. (2) Good results are obtained by leaving the hive just as it is on the summer stands. If the cellar is damp, probably there should be a thin stick under the cover. One must modify conditions of the hive somewhat according to the temperature and moisture of the cellar, but the first statement under (2) holds good in the majority of cases. (3) Temperature may vary four degrees up or down from forty-two, but should remain fairly stable at about forty-two. If bees are quiet they may be supposed to be comfortable. Thermometers vary as much as seven or eight degrees. Try out the bees and see at what temperature they are most quiet. (4) Ventilation is to be considered in connection with heat, but some plan should be provided for ventilation. The intake opening of the flue or pipe should be near the floor. It is especially needed toward spring. (5) Keep the hives at least four inches from the floor. Have four or five inches of chaff, shavings, or some such material under the hives and on the vacant spaces. This material should be dry when put in. Better to pile up the hives one on top of another and thus to leave vacant space in the middle of the cellar than to set them all over the floor. Keep dead bees swept up as much as possible. Absolute darkness is desirable. Take out when maples blossom. Don't delay putting in too long.

MINNESOTA BEE-KEEPERS' ASSOCIATION.

1917 ANNUAL MEETING, WEST HOTEL, MINNEAPOLIS, DECEMBER 4 AND 5.

Presence at this meeting is necessary from the very beginning, 9:00 *a. m., Tuesday, December* 4, as it is necessary to rearrange our entire program to suit the schedules of our visiting bee-keepers from without the state, such as representatives from the bee journals and men from Washington, D. C., as well as some of our long trip northern Minnesota friends. We must hear from these men while here.

You are requested to bring with you some labor saving device or piece of equipment that has proven of value to you. Exhibit space will be provided. Also please send in to the University Division of Bee Culture, University Farm, St. Paul, before December 1st, a copy of a scale record of a colony of bees if you kept one this year. Typewritten copies of all sent in will be on exhibit.—L. V. France, Secretary, University Farm, St. Paul.

SECRETARY'S CORNER

"Eat Less Candy. The Allies need the sugar," says the Food Administration. "All right," our patriotic farm boys and girls are saying, "Nuts and popcorn are better anyway."

Fifty Thousand Quarts of Everbearers.—In a communication from Chas. F. Gardner, Osage, Iowa, under date of October 2, he says, "Vines are loaded now with fine berries, no damage from frost yet. We are troubled to get pickers. We have already marketed since August 15 fifty thousand quarts."—Some strawberry patch.

Minnesota Insect Life.—The Entomological Department of University Farm are publishing a quarterly, an interesting and valuable bulletin, entitled Minnesota Insect Life, which we commend to our membership. This can undoubtedly be secured regularly by application to Prof. F. L. Washburn, University Farm, St. Paul. We note that the July 1, 1917, issue contains the new nursery and orchard inspection law, which everyone purposing to offer trees and plants for sale should certainly read.

No. 1017 Everbearing Strawberry Wins a Prize.—Mr. Jay F. Lyon, of Elkhorn, Wisconsin, writes me that the new everbearing seedling strawberry, No. 1017, which has been sent out now for two or more years to our membership for trial, was entered by him at the last Wisconsin state fair, and it won the first prize. Mr. Lyon also speaks in the highest terms of Minnesota's strawberry No. 3, which he says he finds a week earlier than the Dunlap and a better berry. We are glad to have the value of these Minnesota seedlings confirmed in a neighboring state.

Delegates to and from the Wisconsin Meeting.—We shall have the pleasure of having with us at our annual meeting as representative of the Wisconsin State Horticultural Society, Wm. Toole, the well-known florist and seed grower of Baraboo, Wis. He is to fill an important place on the program, and we are fortunate in having him here. The delegate whom our society will send to the Wisconsin meeting is Prof. T. A. Erickson, who has charge of the Boys' and Girls' Club work in this state, and he will take this opportunity of telling the Wisconsin people how it is done in Minnesota.

Plant Premiums for 1918.—The list of varieties of new fruits, also of flowering plants, etc., to be offered to our membership as premiums for the year 1918 is not yet complete, but will be prepared soon, and will be published in the new society folder for 1918, and also in the January, 1918, issue of the society monthly. A number of very promising varieties of new fruits are to be sent out from the fruit-breeding farm, and every member desiring to participate in this valuable testing of new fruits will have an opportunity of doing so. Please look for the list in the January number, and do not make any selection of plant premiums until it comes to hand. Members have sometimes made selection from the list of the previous year. This is a mistake, as the list for 1918 will be an entirely different one.

Prizes Offered at the Annual Meeting.—Some important changes have been made in the premium list of the annual meeting. It will be noticed that the sum offered to be divided pro rata amongst exhibitors of top-worked apples has been increased from $25.00 to $40.00; on boxes of apples the amount to be divided pro rata has been increased also from $25.00 to $50.00. Changes have been made in the prizes offered for seedling apples, $40.00 only to be divided pro rata amongst early winter seedlings, and $60.00 amongst late winter seedlings. We hope the ladies will note particularly the prize offered for the first time for collections of canned fruits and vegetables. Aside from cutting out certain classes of premiums offered for cut flowers and reducing the first premiums on vegetables from $3.50 to $2.50, there are no other special changes in the list.

LEGAL SIZES OF CONTAINERS FOR FRUITS AND VEGETABLES.—Under the authority of the Federal law known as the standard container act, the Secretary of Agriculture has just issued the regulations fixing the tolerances which will govern in the administration of that act. The act goes into effect on November 1, 1917.

It prescribes three standard sizes of baskets for grapes and other fruits and vegetables—two quarts, four quarts, and twelve quarts—and fixes the dimensions for each; it establishes the dry half pint, dry pint, dry quart, and multiples of the dry quart as standards for containers for small fruits, berries, and vegetables, and fixes their capacity in cubic inches. On and after November 1, 1917, it is unlawful to manufacture or sell for shipment or to ship in interstate commerce, either empty or filled, baskets or containers that do not conform to the requirements set forth in the law.

HAVE YOU RECEIVED THE 1916 REPORT?—As a member of the society for 1917 you are entitled to a bound volume of the 1916 report, containing the magazines and other matter issued that year, provided you have distributed the magazines for the year 1916. The state can not afford to give a member for his personal use and keeping both the magazine and the annual volume. If you have not received this volume and wish to have it, please address the secretary as above, and if you are willing to send ten cents to pay the cost of mailing, it will be appreciated, as the expense of getting out this volume these high-priced years exceeds the state appropriation for that purpose. Members of auxiliary socieities *must in every case* send postage to secure the volume.

"DO BIRDS RETURN YEAR AFTER YEAR TO THE SAME NESTING PLACES?"—I can corroborate your statement by personal observation. We had a big martin box inhabited by a dozen families. One of the birds had a defective wing. He was noticed for several years flying around the box. Also, next to the martin hox was a bluebird box, and when the latter got defective a new one was put on the same pole during the winter. When the bluebirds came back it was noticed that the male who came first lighted on the martin box, but was afraid of the new bluebird box. It took several hours before he dared to enter. It was interesting to watch how he made numerous approaches to the new box, while the old martin hox was known to him and he alighted on that as an old acquantance.

Years ago I listened to a lecture by a well-known German ornithologist. He also claimed that migratory birds return to the same nesting places. He cited as an illustration that while living in the country as a child, they noticed a songbird with an impediment in his voice. The children nicknamed him the "bungler" and heard him around their home for years. Besides it seems only natural that they should do so,—don't we all feel most at home there where we are acquainted, and return where we find a welcome. All creation acts on similar lines.—Otto Kueffner, St. Paul.

THE LORING SEEDLING PLUM PRIZE.—At last the one hundred dollar prize Mr. Chas. M. Loring placed in our hands nearly ten years ago has been awarded. A seedling plum has been found that the judges have decided is worthy to receive this prize. This plum tree is growing at Lonsdale, Minnesota, in Rice County. Mr. John P. Vikla, to whom the prize has been awarded, does not own the place upon which the original tree is growing, but is the authorized representative of the owner, the place where the original tree is standing being within two or three miles of Lonsdale. The fruit is of extraordinary size, well colored, firm-fleshed, and of excellent flavor, although not a free-stone, which is to be regretted, but in other respects it came up well towards the ideal of the awarding committee, which in this case consisted of J. M. Underwood, Chas. Haralson, and Prof. LeRoy Cady. Prof. Cady alone examined the tree and other top-worked and nursery grown trees propagated from it, and his report as to the hardiness and productiveness of the variety was satisfactory to the committee, and upon this the awarding of one hundred dollars was made. This fund has been in the hands of the Executive Board so long that there has accumulated considerable interest, which we understand Mr. Loring wishes to have applied on some other prizes to be offered later.

Minnesota State Horticultural Society

Held in "Colonial Room" of the West Hotel, Minneapolis, December 5, 6, 7 and 8, 1916.

Tuesday Morning Session, 10 o'clock.

The fiftieth annual meeting of the Minnesota State Horticultural Society was called to order in the "Colonial Room" of the West Hotel, Minneapolis, at 10 o'clock, December 5, 1916, by the president, Hon. Thomas E. Cashman, of Owatonna.

Rev. C. S. Harrison, of York, Neb., offered the following invocation: (See index.)

After the invocation the audience was delightfully entertained by a vocal selection rendered by Mr. Trafford N. Jayne, of Minneapolis.

Pres. Thomas E. Cashman then delivered "The President's Annual Greeting."

The President: Friends, I am delighted to see so many present here this morning, and I am pleased to see so many of the veteran horticulturists of the Northwest with us, the men and women that have made it possible to raise good fruit in the central Northwest. I am happy to see you apparently in good health, still in the harness and striving for greater achievements. I am also pleased to see at least a few of the younger people, the future horticulturists of Minnesota, preparing yourselves to take up the burden and assist in furthering the work to greater perfection.

Now, I am not going to deliver a lengthy talk this morning. I find the program filled with good things, subjects that are of the greatest importance to the people of the Northwest, to be discussed by men and women of wide experience and ability. This rare treat has been provided for us by our able secretary, Mr. Latham, and with your permission we will now proceed to enjoy this treat. Before calling upon the first number I wish to announce that each one reading a paper or speaking will be given fifteen minutes unless otherwise specified on the program and the presiding officer will drop the gavel when the fifteen minutes are up. If, however, the audience wishes the person to continue further he will be given additional time.

I wish to announce further, or request, that those who rise to speak give their names to the reporter. He is not familiar with the names of many of you and in order that he may report correctly I will ask that when rising to your feet you give your name.

I will now call upon the first speaker, the first gentleman named on the program, Mr. E. G. Lee, of St. Paul, who is going to tell us how to top-work the young apple tree.

"Top-Working Young Apple Trees" was the subject of a paper read by Mr. E. G. Lee, of St. Paul. (See index.)

Discussion.

The President: We will now proceed to the next subject. Our veteran co-worker, Mr. Harrison, of York, Nebraska, will tell us about evergreens in this country.

Mr. C. S. Harrison then read a paper on "Evergreens." (See index.)

Discussion.

The President: We will ask our good friend, Mr. E. A. Smith, of Lake City, to tell us how to prepare and handle the apple crop.

Mr. E. A. Smith then read his paper on "Preparing and Handling the Apple Crop." (See Index.)

The President: Mr. Smith finished right on the minute. Any questions?

Discussion.

The President: We will now call upon Mr. Henry Dunsmore, of Olivia, and Mr. E. W. Mayman, of Sauk Rapids, to tell us about their prize orchards. Are they present? I am very sorry, we expected some very interesting reports from these gentlemen, perhaps they will be with us later.

The President: I understand there are a number of delegates present from our sister societies, Iowa, Wisconsin and the Dakotas. I wish to say to those gentlemen, and if there are any ladies—I haven't learned there were—we are glad to have you with us and pleased to have you take part in the deliberations of our meetings. We want you to meet all our members, and we want to get acquainted with you and know who you are. Mr. D. E. Bingham, delegate from Wisconsin, we will be glad to have you come forward. Ladies and gentlemen, this is Mr. D. E. Bingham, of Wisconsin, representing the Wisconsin Horticultural Soicety. (Applause.)

Mr. Bingham: Ladies and gentlemen, at this time I haven't anything particular to say. I bring you greetings from Wisconsin. I have had the pleasure of being with you once before, and I took home at that time the report of a very interesting meeting. You people seem to have more enthusiasm up here in Minnesota along horticultural lines than we have in Wisconsin. We are doing things in Wisconsin along many lines, but you seem to have a larger attendance. I bring you greetings from our society and extend to you an invitation to meet with us. We have our meetings next week, and as many of you as can come, we will be pleased to see you. I thank you. (Applause.)

The President: I notice Prof. Hansen, of Brookings, secretary of the South Dakota Horticultural Society, here, representing that society, I presume. Just a word, Professor Hansen.

You all know who the professor is, he has been with us the last twenty years. (Applause.)

Prof. Hansen: I am not a delegate; I think we have a delegate here. The main thing I can report is, we are building up a horticulture out our way, putting in shelter belts and evergreens. We have a good future; we are on the frontier, and we expect that horticulture will be one of the great industries of the state. (Applause.)

The President: I find that Mr. F. A. Hassold, president of the South Dakota Horticultural Society, is here or supposed to be here. If he is we will be pleased to have him come forward. He will probably arrive later. I find that Mr. N. A. Rasmussen, President of the Wisconsin Horticultural Society is here, and we will ask him to say a word. (Applause.)

Mr. Rasmussen: I was with you here last year, and I don't know what would have kept me away this time unless it was that I visited so much with your secretary last week in Washington, but when I thought that over I was more anxious to come than ever. I wanted to tell you at least one thing, and that was to tell you how well your secretary behaved there and looked after us younger boys.

Mr. Latham: It was a hard job.

Mr. Rasmussen: I thought he wouldn't say anything, but I assure you that I am pleased to be with you and as president of the Wisconsin society I will lay stress on what Mr. Bingham has said. I would be pleased to have as many of you as can be with us in Wisconsin, and we will try to take as good care of you as your secretary took of us in Washington. You know how well it was. (Applause.)

The President: Mr. G. D. Black, delegate of the Northeast Iowa Horticultural Society. Ladies and gentlemen, this is Mr. Black, of Independence, Iowa. (Applause.)

Mr. Black: I am very glad to meet with you. I have been here a few times to attend the Minnesota meetings, but in our state, in Iowa, I haven't missed a state meeting or northeastern Iowa meeting since I became a horticulturist, since I joined the society, which is a good many years ago. I have also been a member of this society and the Wisconsin society for a good many years in order to get the reports. I assure you that I anticipate great pleasure during the few days I will be here with you. I may say now that since I was appointed a delegate from the Northeastern Iowa Horticultural Society, I have become a resident of Albert Lea, so you can claim me, if you wish, as your very own. I don't wish to sever my connection with Iowa, because Iowa and Minnesota are very close together, and in our meetings in Iowa we have a great many from Minnesota. I am very thankful to be with you. (Applause.)

The President: Very glad indeed that Mr. Black has chosen our splendid state as his abiding place. Iowa is a great state and has a great future, but we find that the best of them

are coming to Minnesota. We expect Mr. Gardner to move up very soon. I will ask Mr. P. F. Kinne, delegate from the Iowa Horticultural Society, to come forward. This is Mr. P. F. Kinne, representing the Iowa state society. (Applause.)

Mr. Kinne: I must confess to being very glad to be with you. This is the first occasion I have had of meeting with the Minnesota horticulturists, and I am more than pleased to bring greetings from the Iowa Horticultural Society. I feel something like a sponge that your druggist gets from the press, dried out, and I hope that I may imbibe enough of your Minnesota pep and ginger to be in the condition of the sponge when it leaves the apothecary's hands. I want to extend to all of you a very cordial greeting from the Iowa society, and hope many of you will be able to meet with us. (Applause.)

The President: Our meetings couldn't possibly be a success without the presence, aid and assistance of our good friends Gardner from Iowa, Kellogg from Wisconsin and Harrison from Nebraska. I am pleased to know they are all with us, and I am going to ask them to say a word to us at this time. Mr. Charles F. Gardner, of Osage, Iowa. (Applause.)

Mr. Gardner: Mr. President, ladies and gentlemen: To say that I am pleased to be here wouldn't be telling half of the story. I have attended your meetings so long, ever since you met at Lake City, that when I come here I don't feel like going away to see somebody; I fell as if I were coming home. I have almost had charges of desertion lodged against me and being a regular run-away from our state society. You will find in our reports a remark by our president at one time that he got tired of hearing of the other society, that it was so much better, and for his part he believed if he thought so much of this society he would attend those meetings, and—he pretty near said stay away from our society. But I didn't take that. This society is a society that stands in the foremost ranks of horticulture in the United States, and if there is anything I am proud of it is that I am a member of it. When we come here we know we are going to learn something. I never attended a meeting of this society in my life but that I went home rejoicing that the facts I found out I could go right onto my place and carry them out. I want to say also that if there is a better report in the United States than your report from year to year I never saw it. I can say that. (Applause.) You take the last report, for 1915, and bring out any other report of any other state in the Union and you will find it is as good or better than any of them. You see you have men here that stand way up and know how to manage these things. You have a faculty of taking a poor lone man like myself—especially your secretary—telling him that if he don't come to this meeting everything will go to rack and ruin. You make people feel that the meeting won't be a success unless they get out to it, consequently you have a good attendance. Don't think it is an easy job. I was presi-

dent of the Iowa society two years, and I tell you it is a hard thing to manage them. We never could get up the enthusiasm that you have up here. I think you are lucky in your secretary. He is the man that gets up and arranges your report. You look all through that and read the information in it and the index, making it easy to turn to any subject quickly. I think you can be proud of it. I have hardly commenced, but I know that time is precious, so I will quit. (Applause.)

The President: I want to hear a word from the youngest member of our society, but who lives in Wisconsin. Mr. George Kellogg, of Wisconsin. (Applause.)

Mr. Kellogg: Mr. President,—

The President: You all know him.

Mr. Kellogg: I am not sorry to be here. When I was sick in Chicago two weeks ago your secretary wrote me that he was glad I was sick. That was mighty poor consolation, but I am back here to get a lot of Minnesota pep and the vigorous climate. Maybe I shall go to Texas yet.

Mr. Gardner: Come down to Iowa.

Mr. Kellogg: Too much can not be said for the glory of this society. Your president and I think your secretary should have the largest possible commendation. (Applause.) I think he is the finest secretary of any society in the United States (applause), and I think your society is the finest society in the United States—or the world. There is no question about your getting there. You are going right along every year. I am pleased to be with you although I am sad about it. I am glad—well, I am glad because I have two girls living right here and I make my home with them, and I have another home in Janesville, and I have a home in Texas. I am a sort of a wanderer. I quit the berry business, but I am just as much interested in strawberries as ever. I won't take your time any longer. I thank you for your attention and I am glad to be with you. (Applause.)

List of judges was then read by the president, after which the meeting was declared adjourned until 1:30 P. M.

LIST OF JUDGES.

APPLES.

Single Varieties—R. S. Mackintosh.

Pecks of Apples—G. W. Strand.

Top-Worked Apples—F. I. Harris.

Boxes and Barrels of Apples—Prof. Richard Wellington and Prof. E. G. Brierley.

GRAPES.

A. Brackett.

NUTS.

Thos. Redpath.

FLOWERS.

Wm. Desmond.

VEGETABLES.

J. V. Bailey.

APPLE SEEDLINGS.

Clarence Wedge, Chas. Haralson and G. W. Strand.

COLLECTION OF APPLES.

Le Roy Cady.
(Recess until 1:30 P. M., December 5, 1916.)

Tuesday Afternoon Session.

The preliminary question and answer exercise was begun at 1:30 o'clock and was conducted by Mr. J. Kimball, of Duluth, on the subject of "Bees in the Garden and Orchard." (See Index.)

The President: I am now going to take a little time and depart from the regular order for a few moments to call upon a man that has meant wonders to this society. You know we all honor and revere men that do things in this world. We honor the old soldier for the part he took in driving slavery out of this country and for unifying this great nation of ours, and when we see that little brass button on the lapel of his coat worn by the old soldier we can not help but honor him. At least I do; I want to shake his hand. We honor men who by their efforts bring about better things. We have a man in our midst today—I didn't know he was here until the noon hour—who was one of that little band of twelve who gathered at Rochester fifty years ago for the purpose of organizing this society. He is the only living member of that little party that gathered there fifty years ago for the purpose of organizing this society and made up their minds they were going to try to give to the people of the Northwest something that did not then exist, trying to make it possible to raise fruit successfully in this northwestern region. The gentleman whom I refer to, and whom you will all be glad to meet, is Mr. C. L. Smith, of Portland, Oregon. He has been a busy man during all these years. At the present time he is agriculturist of the Oregon-Washington Railway Company, a part of the Union Pacific. While he is old in years, he appears to be young in spirit. We haven't time to give him an opportunity to speak to us at length at this time, but I want him to come forward; I want to have an opportunity of introducing him to you, and I take great pleasure in calling Mr. C. L. Smith, of Oregon, to the platform. (Applause.) (See Index.)

The President: I am sure I voice the sentiment of all present by saying we are pleased to have you with us and will be happy indeed to have you take part in the discussions and

particularly on Thursday afternoon, when the semi-centennial session will be held.

I am now going to call on the president of the Wisconsin Horticultural Society to tell us how he raises strawberries by means of irrigation.

Mr. N. A. Rasmussen then gave an address on the subject of "Strawberry Culture with Irrigation." (See Index.)

Discussion:

The President: We will now have an address on raspberry culture by a very successful raspberry man, Albert O. Hawkins, of Wayzata. (Applause.)

Whereupon Mr. Albert O. Hawkins, of Wayzata, read a paper on "Raspberry Culture." (See Index.)

Discussion:

The President: We are fortunate in having with us Professor G. R. Hoerner, Assistant Plant Pathologist at the University Farm.

The gathering was then informed on "Raspberry Diseases In Minnesota," by Mr. G. B. Hoerner. (See Index.)

Discussion:

The President: We will now call on our hustling Farmers' Institute lecturer, Mr. Brackett, who is going to tell us about his everbearing strawberries.

Mr. A. Brackett then read a paper on the subject of "Everbearing Strawberry Field." (See Index.)

Discussion:

The President: We have another gentleman who has had large experience in growing everbearing strawberries, Mr. Charles Gardner, of Osage, Iowa. (Applause.)

Mr. Charles Gardner, of Osage, Iowa, then read his paper on "Everbearing Strawberries at Osage, Iowa, in 1916." (See Index.)

Discussion:

The President: Mr. D. E. Bingham, delegate from Wisconsin, will tell us about the opening up of the fruit farm.

The meeting was then addressed by Mr. D. E. Bingham with a paper on "Opening Up the Fruit Farm." (See Index.)

Discussion:

The President: "The Native Plum, Its Hybrids and Their Improvement," by our plum specialist, Mr. Dewain Cook, of Jeffers. (See Index.)

Mr. Cook then read a paper bearing that title.

Discussion:

The President: We will proceed to the next subject of winter injury to plums in 1915-16, by Professor J. Dorsey, Section of Fruit Breeding at the University Farm.

Prof. Dorsey then addressed the audience upon the subject of "Winter Injury to Plums in 1915-16," as follows: (See Index.)

The audience was then instructed and entertained by two lantern talks, the first one, entitled "Snapshots on the Road. Nurseries; Top-working; Blister Rust," given by Prof. F. L. Washburn, State Entomologist, University Farm; the second one, entitled "Nature of Plant Diseases," given by Mr. G. R. Bisby, Assistant Plant Pathologist, University Farm.

The meeting was then declared adjourned until the evening session.

Tuesday Evening Session.

Minnesota State Florists' Society.

Prof. LeRoy Cady, president, in the chair. Meeting was called to order at 8:00 o'clock, and the program proceeded with, as follows:

"Storing and Handling Gladiolus Bulbs," by Mr. G. D. Black, delegate Northeastern Iowa State Horticultural Society, Independence, Iowa. (See Index.)

"Resources of Present-Day Florists," by W. E. Tricker, St. Paul.

"Greenhouse Management," by Prof. Wm. Moore, University Farm.

"Some Native Shrubs and Their Uses," by Mr. E. Meyer, Minneapolis. (See Index.)

Wednesday Morning Session.

A half hour question and answer exercise was led by Alfred Perkins, Market Gardener, St. Paul, on the general subject of "The Vegetable Garden." (See Index.)

Vegetable Gardeners' Program.

The meeting was called to order by Mr. N. H. Reeves, Minneapolis, President Minneapolis Market Gardeners' Association at 9:30 o'clock.

The President: We will continue the garden discussion with a paper by E. C. Willard, of Mankato. Mr. Willard does not seem to be present just now so we will pass to the next number on the program, "Hotbeds and Cold Frames Nine Months in the Year," by N. A. Rasmussen, president Wisconsin State Horticultural Society. (See Index.)

Discussion:

The President: We will now have an address by Prof. Richard Wellington on the improvement of vegetable varieties by selection.

"Improvement of Vegetable Varieties by Selection," was then discussed by Mr. Richard Wellington, Horticulturist, University Farm. (See Index.)

This address was followed by "Some Phases of Onion Growing," by Mr. W. T. Tapley, Assistant in Horticulture, University Farm. (See Index.)

Discussion:

The President: I wish to announce that the Garden Flower Society business meeting is about to commence. All those who wish to attend may do so. Our next subject will be: "Irrigation in the Market Garden," by Mr. C. E. Warner, Osseo. (See Index.)

Discussion:

The President: Mr. Nic Lebens, who was to have the next number, is not present, and we will now listen to a talk on growing radishes, by Mr. Charles Hoffman.

Thereupon Mr. Charles Hoffman, of White Bear, read a paper on "Growing Radishes." (See Index.)

Discussion:

The President: "A Winter Garden In the Cellar," will be the next subject, an address by Mr. N. A. Rasmussen, president of the Wisconsin Horticultural Society. (See Index.)

Discussion:

The President: "Home Canning," by Mrs. Louis M. Glenzke, Hopkins. (See Index.)

Mrs. Glenzke then read a paper on the subject of home canning, after which the meeting was declared adjourned until 1:30 o'clock.

Wednesday Afternoon Session.

The session was opened with an exercise on "The Flower Garden," which was led by Mrs. H. A. Boardman, St. Paul. (See Index.)

The regular afternoon session was called to order by President Cashman at two o'clock.

The President: We have a very interesting session this afternoon, and I hope all will remain who can. To start with, I wish to say this, that it has never been my good fortune to preside over a meeting where people were more enthusiastic or where they better understood the subjects they were discussing. I have only this criticism to make, that the speakers do not talk loud enough. (Applause.) Unfortunately those sitting in the back seats can not hear those talking up in front. We have subjects to be discussed this afternoon of great importance and value to all of us, and I hope that not only the speakers, those who are discussing the subject, but also those who are taking part in the discussion will speak up—use those splendid voices you have.

The subject of spraying will be considered this afternoon, and it will be discussed by men of wide experience, Mr. Harold Simmons, of Howard Lake; Mr. E. Yanish, of St. Paul; Mr. A. H. Reed, Glencoe; and Mr. J. J. Dobbin, of Excelsior.

I will first call on Mr. Harold Simmons, of Howard Lake, the veteran orchardist, who has had a large experience in this line.

Mr. Harold Simmons thereupon read a paper on the subject of "My Spraying Experiences." (See Index.)

Discussion:

The President: The next subject is "Orchard Pests in Minnesota during 1916," the first subdivision being "Diseases," which will be discussed by Professor E. C. Stakman, head of Section Plant Pathology, University Farm.

Professor E. C. Stakman thereupon gave an address upon this subject. (See Index.)

The President: Now the subject of "Insects" will be discussed by Professor A. G. Ruggles, assistant entomologist, University Farm. (See Index.)

Professor Ruggles thereupon read a paper on that subject.

Discussion:

The President: I will ask the president of the Minnesota Garden Flower Society, Mrs. E. W. Gould, to come and take the chair.

The meeting conducted by the Minnesota Garden Flower Society was called to order by the president, Mrs. E. W. Gould, at 3:15 o'clock.

The President: It is my privilege to welcome this large audience, your attention proving that each year more and more attention is being given to the cultivation of flowers. The gardener wants to try new varieties. Our first speaker has devoted years to work of producing these plants, having made journeys to Siberia in search of hardy varieties to use in his work. Not only has he given us hardier varieties of flowers and fruits but he has also brought back other specimens entirely new. We are greatly honored in having him talk to us of them.

Ladies and gentlemen, I have great pleasure in introducing at this time the Burbank of South Dakota, Professor N. E. Hansen. (Applause.)

Professor N. E. Hansen, of Brookings, South Dakota, then spoke on the subject of "Some New Plants at Home and Abroad." (See Index.)

Discussion:

The President: The architect has come to feel that the home without a proper setting of flowers is not successful. Our next speaker, one of our leading and best-known architects, will discuss "The Home Setting as the Architect Sees It," and I am very happy to introduce at this time Mr. Harry W. Jones, of Minneapolis.

Mr. Harry W. Jones then gave an address upon the subject of "The Home Setting as the Architect Sees It," illustrating the same with many lantern slides.

The President: Thank you very much; you have given us a great deal. (Applause.) Our next speaker is called sometimes the "bird lady" and sometimes the "conservation lady," but always the "flower lady." With so many appropriate titles to choose from, I will simplify matters by embracing them all, and I will introduce our able lady, Mrs. Phelps Wyman.

Mrs. Phelps Wyman, of Minneapolis, thereupon gave an address upon "A Composite of Composites—Useful Plants for Fall Bloom," accompanied by lantern slides.

The President: If there are no questions you wish to ask Mrs. Wyman we will pass to the next subject on the program, but before I go I want to thank you for your attention this afternoon and to assure you that you will always receive a very warm welcome at any of our meetings. We have monthly meetings, and we will welcome you as visitors or as members at any time. Thank you. (Applause.)

The afternoon session was concluded with a lantern talk by Mr. E. G. Cheyney, professor of forestry, State University, after which the session was declared adjourned until 9 o'clock Thursday morning.

Thursday Morning Session.

A thirty-minute question and answer exercise on "Success in Orcharding" was led by Mr. J. F. Harrison, Orchardist, of Excelsior. (See Index.)

The regular session was then announced by President Cashman.

The President: The first number on the program after the question and answer exercise is to be discussed by Mr. M. Soholt, of Madison.

An address on "Evergreens for Prairie Homes," was read by Mr. Soholt. (See Index.)

The President: I will ask our good friend, J. M. Underwood, to take the chair while I am out of the room. It is necessary for me to leave the room for a few minutes.

Mr. Underwood thereupon took the chair and after Mr. Soholt finished the reading of his paper he announced that there was some little time for discussion.

Discussion:

Mr. Underwood: The next subject is a talk by T. A. Hoverstad.

Thereupon Mr. T. A. Hoverstad, of Minneapolis, gave an address on the subject of "Windbreaks by the Mile." (See Index.)

Discussion:

Chairman Underwood: Now, the next on the program is an address by Mr. E. M. Reeves, of Waverly, Iowa, on the arrangement of farm buildings and grounds.

Mr. E. M. Reeves thereupon read a paper on the subject of "Arrangement of Farm Buildings and Grounds for Convenience and Artistic Effect." (See Index.)

Discussion:

Mr. Underwood: The next on the program are reports of committees, but we can pass those in view of other interesting subjects that are to be taken up, and I will call on Professor S. A. Beach, who will speak to us on the subject of "A Successful Orchard." (See Index.)

Professor Beach then spoke on that subject, as follows: (See Index.)

Mr. Underwood: We would like to be able to take time to discuss this address and call for questions and answers, but our program is so full I think we will have to pass on to the next number on the program. We have an interesting feature here, an address by Prof. Brodrick on "Development of Horticulture in Western Canada." (See Index.)

Professor Brodrick: With your permission I will read my address and afterwards I will give you an opportunity of asking any questions you wish to ask in regard to the work we are doing in Western Canada. It affords me great pleasure indeed to be with you again. I had the opportunity of being here last year, and I felt wonderfully repaid in coming here and listening to the splendid discussions that were held. We in Manitoba are looking to you a great deal in our work there, and of course we are taking a great deal of interest in the problems which you are having to meet.

Professor F. W. Brodrick, horticulturist of the Manitoba Agricultural College, then read an address on "Development of Horticulture in Western Canada." (See Index.)

Professor Brodrick: In Manitoba Professor Hansen is those whom are discussing the subject, but also those who are regarded as a personal friend. The fruit growers there are in correspondence with him a great deal and getting, as far as we can, his introductions and making a trial of them under our conditions. (Applause.)

At this time President Cashman resumed the chair.

Mr. Underwood: I will resign my position, but before doing so I want to say a word about the Gideon Memorial Fund. The next on the program will be essays given by four of the students of the University Farm School in contest for prizes, the prizes given as the result of the Gideon Memorial Fund, which is in the hands of the board of regents of the State University. You may not all know that we raised $500 and placed it with the board of regents and the interest on that is given each year as prizes to contestants in giving essays here before our society on horticultural subjects.

That is to be the next on the program. In growing Wealthy apples and marketing them and eating them every day three times a day and then between meals I get such an

enthusiasm for the Wealthy apple that I don't know how to express it. I met a man in Miami, Florida, last winter; he has large fruit interests near Philadelphia and he says that the apple that brings him the most money is the Wealthy. George T. Powell, whom you perhaps remember—he was with us—the foremost horticulturist of the eastern states, lives in New York and has a large orchard near Albany that I have visited, and he says the apple that he makes the most money off is the Wealthy. I don't know how to express myself and have taken one way which is a little different. Instead of talking I shipped a barrel of Wealthy apples up here for you to eat. When these students get through their essays if you care and will remain I would like to give you, each of you, a Wealthy apple, and as it is pretty near dinner time perhaps you will relish it. (Applause.)

The President: I will now announce the judges of this contest: Professor Brodrick, Professor Hansen and Professor T. M. McCall. The names of the young men who are to take part in the Gideon Memorial contest are Robert McKeown on the Codling Moth, (see Index); Henry Kaldahl on Rust, (see Index); R. C. Shaw, Windbreaks, (see Index), and K. O'Bara on Udo. (See Index.)

The four contestants then proceeded to give their essays, after which the meeting was adjourned until the afternoon at 1:30.

Thursday Afternoon Session.

The preliminary half-hour session was conducted by Mr. C. H. Ramsdell, landscape architect, Minneapolis, on the subject of "Ornamentation of Home Grounds." (See Index.)

The President: The next subject under discussion will be horticultural work with the Boys' and Girls' clubs. in Minnesota, by T. A. Erickson, State Club Leader, University Farm. Is Mr. Erickson present? While we are waiting I will ask the judges to state their awards in the matter of the Gideon Memorial contest. I find the report lying here on the table. The judges' decision is as follows: Robert McKeown, first; Henry Kaldahl, second; R. C. Shaw, third, and Mr. K. O'Bara, fourth. Signed, F. W. Brodrick, N. E. Hansen and T. M. McCall, judges. Is Mr. Erickson present?

Mr. T. A. Erickson then read a paper on the subject of "Boys' and Girls' Clubs in Minnesota," which was followed by a talk by Carl Pathoff and one by Laura Hintze. (Prolonged applause.) (See Index.)

Mr. Erickson: Just a minute; Mr. Latham wanted me to present this boy and girl with these two ribbons. At the same time I want to present the little gold medal which is given by the Government to boys and girls who make a special record of this kind. They have this plan all over the country,

and I want to take this occasion to present them, if you do not object. It is called the all-star method.

(Miss Laura Hintze is presented with the badge and medal amidst applause.)

Mr. Erickson: This makes her an all-star member and will go on the records at Washington this way. I think this is the kind of achievement we ought to encourage. The next will be to Carl. He is also entitled to the medal, but for some reason or other we haven't got it today, but we will get it.

(Master Carl Pathoff is presented with the ribbon. Applause.)

Mr. Baldwin: Is there any time to discuss this matter?

The President: This is a very important matter and we will be glad to hear from you.

Discussion:

The President: We have a number of delegates and friends from without the state who have not been heard from. We had a reception of delegates here the first day, all that were present at that time, and I am going to ask those not present at that time to come forward so we may get acquainted with them, and I will ask them to participate in this meeting from now on.

I just learned that the president of the South Dakota Horticultural Society, Mr. F. A. Hassold, is present. Mr. Hassold, will you please come forward? We would like a word from you. Ladies and gentlemen, this is Mr. F. A. Hassold, president of the South Dakota Horticultural Society. (Applause.)

Mr. Hassold: Mr. President and members of the Minnesota Horticultural Society: It is a pleasure to be here and have the opportunity of having been honored to represent our South Dakota Horticultural Society at this, your fiftieth anniversary. I am neither a practical horticulturist nor a scientific horticulturist, but only a back country minister who was honored with the office that I hold. I come, having been sent for the purpose of learning not imparting wisdom, and, coming from the West, come to the sources of light, the East, in order that I might learn. You have wisdom in our Professor Hansen, you have the practical side in other members of our society, Mr. Whiting and Mrs. Whiting. I come simply as one who comes to learn and thank you for the opportunity of learning as I come meeting with your society. I shall go back with the expectation of making use of some of the wisdom gathered that I may manifest my appreciation at its best in attempting to create in our society something of the spirit that characterizes yours. Thank you. (Applause.)

The President: I hope the reverend gentleman will be with us at the coming meetings. One of the gentlemen who contribute perhaps as much or more than any other member of this society is Rev. Mr. Harrison, of York, Nebraska. He has been a wonderful help to us and I have just been informed that he is a

delegate from the Nebraska society this year. We have heard from Rev. Harrison several times this meeting. Have you anything further to say? (Laughter.)

Mr. Harrison: I can simply bring you the greetings of the Nebraska society to your own society, and this society is something they can look up—and look up quite a ways, too.

A Voice: Amen.

Mr. Harrison: Your membership is large compared to ours. I don't know how many there are of us. I don't pay much attention to that. My chief interest is up here. Something would go out of my life if I couldn't be here and spend a few days with you. You are the best fellows on earth, I love you and can't get along without you. The memory of this lasts through the year, and I look forward to these visits every year. I don't know for how long the Lord will need my life for His work. I have been studying the mission of beauty and it is a great subject. I am getting ready to prepare a book on this subject, the "Mission of Beauty." I want to leave horticulture and floriculture and go out into the open where I can sometimes ponder upon the mighty God's high places.

A Voice: Halleluiah.

Mr. Harrison: What is the use of groveling and crawling when you can rise on the wings of eagles? When I get this book out I want you to get it. I have tried to do some good for you and when you get this book it is not simply on my own account, I want to do you some good. (Applause.)

The President: Professor Brodrick of the Manitoba Agricultural College favored us with a very fine address this forenoon. I don't know whether you knew who the gentleman was, and I am going to ask him to come forward. I know there are a great many here at the present time who haven't met him. Professor Brodrick, we would like a word from you. (Professor Brodrick is not present.) I have just learned that Mr. Wesley Greene, secretary of the Iowa Horticultural Society has been with us. If he is in the audience room we will ask him to please come forward. (Applause.)

Mr. Greene: Mr. Chairman and ladies and gentlemen: It is certainly a great pleasure to meet with you. I have heard considerable of your society. It is said that those who live near the North Pole have more pep in them than those who live near the tropics, because it is necessary that they put forth greater energy to accomplish the object of their hopes than it is farther south. Perhaps that is the reason why you are more energetic up here. You work harder to accomplish the objects you want. I come from a little farther south.

We are interested in one thing, and that is, we want a little legislation. The thing is in the air not only in Iowa but in Illinois, Missouri, Kansas, Nebraska and Virginia. They are all making an effort to establish a standard grade of fruits. I want to impress it upon you people here in the north, if you haven't

already thought of it, to have it passed at your next legislature if possible, a grading act by which we can grade and pack our fruit, and when we put it on the market we will know that we have fruit that is A No. 1. If we have a bushel of Jonathan or Grimes or Wealthy with a standard mark on it, we will know what it is, and that the standard bushel is worth the money. The trouble with us is we can't tell beforehand what kind of fruit we get in a package, and we buy it and then we are not satisfied.

I have been interested in what we have heard about the children. We can teach our children in school to put up a carton containing six or twelve apples just as good as anybody else can. It should be so that when you go to the grocery, or order from the grocery, a carton of six good apples to place upon your table and you get them, they are fit to eat. After they are in cold storage a while they are not fit to eat. The storage of apples is a commercial proposition, and the apples are not fit to eat. We pick them too early, they never get into good condition, the storage men insist on having them so they will keep.

I have been talking altogether too long but I simply came up here so you could see what I looked like.

The President: We have but two minutes left and I am going to give Professor Waldron one-half of those two minutes.

Prof. Waldron: That is more time than I want. What I have to say to this audience will be said some time during the remaining part of the afternoon, and I think everything I have to say will be incorporated in the few remarks I have to make. It affords me great pleasure indeed to come down here and meet with you people. You have passed the half century mark, and I have passed the quarter century mark as an honorary member of this society. Twenty-five years ago this December, at the motion of Professor Green, I was made a life honorary member of the society. I considered it then one of the greatest things that had come to me, but I didn't realize then how much it would mean in my life, and I will try and express it later on.

The President: I understand Mr. E. M. Reeves, of Waverley, Iowa, is here. (Not present.) Is Mr. Whiting, of Yankton, South Dakota, here? Just a word from you, Mr. Whiting.

Mr. Whiting: For the little I have to say it is hardly necessary for me to come forward. As one of the other speakers said, I will give you a chance to look at me, but you won't see very much. I will say, however, that it has been a great pleasure to me to meet with you here in Minnesota. I came to Minnesota when I was a little boy twelve years old, and at that time it was not considered a fruit country. They did grow a few Siberian crabs, but it was said that apples could not be grown in Minnesota. So you can see it is really a great pleasure to me to meet men here who have made fruit growing a success in Minnesota. It is really an honor to be associated with

that kind of people. I want to thank you for your attention. (Applause.)

The President: We will have a half a minute for our friend Philips. There are three or four people people here who have not met our best friend. Stand up, Mr. Philips, and say: 'How do you do?'

Mr. Philips: They have seen enough of me, my goodness. I don't want to make a show of myself all the time.

The President: I believe Professor Cady has an announcement to make.

Professor Cady: From time to time the executive committee of the Horticultural society has recommended for honorary life membership the names of individuals who have been for a long time members of the society or who have done some special work for the society. Following out that custom, at their last meeting the committee recommended the following people for your action today as honorary life members:

Mr. Martin Penning, of New Ulm, the originator of the Surprise plum and of several other fruits; Mr. H. J. Ludlow, of Worthington; Mr. Peter Clausen, of Albert Lea; Mr. John Penney, of Wisconsin. These are old members and they have done, the first two especially, a great deal of work in southern Minnesota in furthering horticultural interests and work. Also Mr. John Murray, of Excelsior, who has been a member a great many years, and who for a good many years was interested in grape growing and in other horticultural pursuits in that section.

I believe this is the first time that they have recommended some of the ladies. We recommend the following. In some instances they have been members of this society and interested in the Woman's Auxiliary and other work of the society for twenty years. I believe in one case over forty years: Miss Emma V. White, Minneapolis; Mrs. J. M. Underwood, Lake City, and Mrs. Jennie Stager of Sauk Rapids.

I move the adoption of the report and election of these members as honorary life members.

Mr. Harrison: I second the motion.

The President: All those in favor of the motion make it manifest by saying aye. Contrary no. The ayes have it; it is so ordered. We will now proceed to the annual election of officers. Remember those entitled to a vote in the election of officers are those who have been members for three years or who are life members. I will appoint as tellers Mr. LeRoy Cady and Mr. M. J. Dorsey. The first officer to be elected will be a president for the coming year.

Professor Mackintosh: Mr. President.

The President: Professor Mackintosh.

Professor Mackintosh: This is the time when we are called upon to elect our officers for the coming year. Mr. Cashman, the present president, who has been president for a few years, has been an efficient officer both in the affairs of the society and

in the affairs of state. Therefore, I think it fitting that we should continue Mr. Cashman in this office, and I nominate Mr. Cashman for this position. Furthermore, I move that the secretary cast the vote of the society for Mr. Cashman for president for the coming year.

(There are many seconds.)

Professor Mackintosh: All those in favor of this motion, please make it manifest by saying aye. Contrary-minded no. The motion prevails. Mr. Cashman is duly elected. (Applause.)

The President: Ladies and gentlemen: This is no time for speechmaking, but I assure you I appreciate more than words can express your kindness towards me at this time. Now, while I am only too glad to serve you in any capacity that may be in my power, I realize full well that the office of president should be passed around. It is for the good of the society that it should be passed around, and I want to say at this time that when a year rolls around that you be prepared to pick out the very best man you have to serve as president of this society. I remember the courtesy and kindness shown me in the past, and I am only too glad to serve you, but I am mindful of the best interests of this society, and I know it is not a good thing to have one man in office too long as president. The other officers are different. I thank you, and we will continue to the further election of officers. (Applause.)

Thereupon, upon nomination and unanimous vote, Mr. A. J. Baldwin, of Northfield, was elected to succeed Mr. John P. Andrews and, Mr. E. Yanish, of St. Paul, was elected to succeed Mr. Langford W. Smith, as members of the executive board for three years. Mr. George W. Strand was unanimously reelected treasurer. The following gentlemen were unanimously elected vice presidents for the coming year:

Wm. French, First Congressional District, Austin.
W. T. Warren, Second Congressional District, Slayton.
John E. Sten, Fourth Congressional District, St. Paul.
J. E. Miner, Fifth Congressional District, Minneapolis.
A. F. Bugbee, Sixth Congressional District, Paynesville.
M. Soholt, Seventh Congressional District, Madison.
E. L. Kimball, Eighth Congressional District, Duluth.
L. Johannessohn, Ninth Congressional District, Beltrami.
N. N. Oslund, Tenth Congressional District, Cambridge.

Semi-Centennial Anniversary Session.

The President: We have now arrived at the Semi-Centennial Anniversary Session. I will ask our good friend, J. M. Underwood, of Lake City, to preside at this session.

Mr. Underwood assumes the chair amidst applause. (See Index.)

The first number will be a song by Trafford N. Jayne, whom you all love to hear.

Mr. Jayne favored the audience with a song and was recalled and responded with an encore.

Mr. Underwood: We will next hear from Mr. A. W. Latham, secretary, on "Some History." (See Index.)

Mr. Latham: I don't know whether I shall succeed in making myself heard. If I don't speak loud enough you must tell me so in the back end of the room. I am not very much used to public speaking or reading in public. I had quite a little difficulty in preparing the paper I am about to read to you. It has been part of my mission as secretary to tell people to make their papers short, boil them down, and when I came to write one myself I found that wasn't such an easy matter. I read this over, and it took me half an hour. Then I boiled it down some and read it over again and then I boiled it down some more and read it again. This is the dregs that are left after boiling it down twice. (Laughter.)

Mr. Latham then read his paper, interpolating that he didn't remember about Mr. C. L. Smith at the time the paper was written; that Mr. Smith was still living and was with the members today. Mr. Latham's paper was received with applause.

Mr. Underwood: I don't know whether that splendid paper is of as much interest to you as it is to me, but it certainly is a very pleasant thing for me to listen to the mention of the names that formed the working force of this society in the past fifty years. We will next hear of the heroes of Minnesota horticulture, by Mr. Clarence Wedge.

Mr. Clarence Wedge then read his address on "Heroes of Minnesota Horticulture." (Applause.) (See Index.)

Mr. Underwood: We listened this forenoon to the four splendid addresses by the students of the University Farm and now we have the pleasure of having with us Dean Woods, who will bring to us the greetings from the University Farm.

Professor A. F. Woods thereupon gave an address under the title of "Greeting From University Farm." (Applause.) (See Index.)

Mr. Underwood: I am glad that Mrs. Philips isn't here, because we want to hear from Mr. A. J. Philips now on "Personal Recollections." You know he says that Mrs. Philips won't let him talk, but we don't believe that. Mr. Philips, we will be glad to hear from you.

Mr. A. J. Philips read his paper on "Personal Recollections," eliciting laughter and applause from the audience. (See Index.)

Mr. Underwood: We will now listen to Mrs. Jennie Stager, of Sauk Rapids, on "The Ladies of the Society."

The subject of "The Ladies of the Society" was interestingly dealt with by Mrs. Jennie Stager. (Applause.)

Mr. Underwood: I will next call on Professor C. B. Waldron, of the Agricultural College of North Dakota, to deliver his address.

Professor C. B. Waldron read a paper on "The Minnesota Society and the Northwest." (Applause.) (See Index.)

Mr. Underwood: I think you will be pleased to hear from Mr. C. L. Smith, who is not on the program, but we are very glad to put him on the program because he is one of the charter members of this society and the only one living, and I would like to have Mr. Smith speak to you for a short time now. (Applause.) (See Index.)

Mr. Underwood: It gives me great pleasure and I know it does you to have me call on Mr. C. S. Harrison, of York, Nebraska, who will speak to us on "Looking Ahead."

Mr. C. S. Harrison then read a paper on the subject of "Looking Ahead." (Applause.) (See Index.)

Mr. Underwood: Our concluding number on this program will be a lantern slide talk, "Veterans of Minnesota Horticulture," slides prepared by Professor LeRoy Cady.

A running talk was made by Secretary Latham, interspersed with remarks by the members as the faces of the veterans of the society were thrown upon the screen.

Friday Morning Session.

The "Question and Answer" half hour was devoted to the general subject of "Birds a Factor in Horticulture," and was led by Mr. R. E. Olmstead, of Excelsior. (See Index.)

The President: We will discuss a very important question at this time. We are going to take up a staple food which some people are keeping in their vaults, and are so high in price that the average man can scarcely taste them, and that is the potato. Potato selection by a man that knows, P. E. Clement, of Moorhead.

Mr. P. E. Clement then read a paper on the subject of "Potato Selection." (See Index.)

Discussion:

The President: The next number will be an address by Mr. Brierly on "Vinegar." He doesn't seem to be present just now.

Mr. Underwood: While we are waiting I want to emphasize the importance of good preparation of seed. The last speaker spoke about cleaning wheat. We are very particular about cleaning our wheat, we do not grow very much wheat, but this year our wheat yielded a little over twenty-six bushels to the acre, and I didn't hear of anybody around in the country on the farms that had over five or six or ten bushels to the acre, at most. We are very particular to clean our seed the very best we can and only sow the best of seed. The same with corn. So it pays to do your work well.

Mr. Clement: In regard to the cleaning; the result depends upon what has been done before up there in potatoes. We didn't get as good an average yield this past year. In

some of our sections up there, I am ashamed to say, they are hauling better than fifty per cent of wild oats to market in their wheat. There is an opportunity there.

The President: While waiting for Mr. Brierley, I am going to ask Mr. Crosby, secretary of the legislative committee, to make a report on our proposed horticultural building, our home, which we hope to obtain at the coming session of the legislature.

Mr. Crosby: Mr. President and friends: It will be remembered that a year ago the committee made its report in regard to the proposed bill, but we did not succeed in the last legislature owing to opposition that came from a particular source which it is perhaps not necessary to mention at this time. But the committee proposes to go to the legislature at the coming session with the expectation of getting the bill passed.

The bill provides, as you may remember, for an appropriation of $40,000, and the building is to be located upon the land of the farm school. Plans have already been drawn, and it is to be located about two blocks from the street car, something like that, from the Como-Harriet line.

Now, it wants to be distinctly understood, if we are going to have this bill passed this winter, every member of this society must do his best and see his senator and representative and get his vote, not only his vote but his influence to pass that bill. You ought to see, gentlemen, how impossible it is for the committee to do that work. We cannot do it, but this society has members in every county in the state, therefore it is up to you to see your senator and representative and talk the matter over with them and not only get his vote or pledge his vote but get his influence to do anything that he possibly can towards accomplishing the passage of the bill.

One other thing the committee wants to know. Is there any opposition to our having a new hall? If there is, the committee wants to know it. I don't think there is, but we have heard it said: "Oh, it is convenient to meet around in places like this; it is handier here, etc."

Gentlemen, it seems to me that such an organization as the State Horticultural Society, and what it stands for, and what it has accomplished in this state—isn't it a kind of an apology, going around the way we do, for such an organization as this? I certainly think so. Look at the exhibits of fruits out here in these several rooms here. Isn't that an apology, almost? We had a much better exhibit some years ago, of course, in the basement of the Unitarian Church, but even that wasn't what we desired. What we desire is a good auditorium, something larger than this, at least twice as large as this. Yesterday and the day before, there was hardly sitting room in this place, and it is objectionable in other ways. We want a hall that is suit-

able for our needs, where we can have a good auditorium; we also want a good exhibit room for our fruit.

Don't be afraid of calling upon the state legislature for an appropriation. As I have said before, and you know it, when the legislature assembles, the cry goes up of retrenchment and decreasing taxes, etc. That is always the case when the legislature assembles. Bear in mind, gentlemen, that Minnesota is a rich state, there is no getting around that. It is a very rich state, and it is capable of building a hall for the State Horticultural Society and never know it. It is capable of doing a great many things. It is a wonderful state and I am proud to be a citizen of it, and I am proud to be a member of the State Horticultural Society.

If you want a hall will you take a little pains to do a little work in the different counties and towns where you live to help us get a hall? The only way to do this is by seeing your representative and talking the matter over with him. Our people made the proposition two years ago. They liked it, as a general thing. Several of them asked me why I didn't bring the bill right on the floor of the house. The bill was killed in the committee. If it doesn't get out of committee at the proper time this year, I would like to see a minority report come in and placed before the senate and the house, and I think the bill will pass with the proper amount of work, and the committee is willing to do all it can. I am willing to do all I possibly can up to the first of February, when I expect to go away for a month or six weeks, but up to that time I am more than willing to do any work I can in connection with my own business. In that way, by co-operating and working together, I think it is very probable indeed that we may get an appropriation. When we have a new hall we will be able to do our work much better than we do now, and I certainly think we are entitled to it fair and square. I thank you. (Applause.)

The President: Mr. Underwood is also a member of the committee. Have you a word for us?

Mr. Underwood: It hardly seems necessary for me to say anything. I think Mr. Crosby has put the matter in the very best way for us, but I have been actively interested in this society so long that perhaps I see our needs more than you do who have not had the actual working of the society to be responsible for. I see more clearly what we need and how we can improve our condition.

I have visions of a larger society. We are fifty years old now, and look at the progress we have made in that fifty years. We only had a handful of people in attendance fifty years ago and now look at the splendid audience we have out here this past week. We should have an audience room built on scientific principles, with comfortable seats and with such good acoustic properties that every one could hear the speakers who have not good carrying voices in the farther part of the room.

That is very important. This room is very pleasantly situated in the matter of not being disturbed by people coming in, better than most places where we have met, but it is not large enough, and then, as Mr. Crosby says, we haven't any adequate place to make an exhibit. I have visions of an exhibit room that is so scientifically arranged that we can have the whole exhibit to look at and not have it divided up into fruits, flowers and vegetables.

There is so much that can be done more than we are doing now. We have never had a good exhibit room. If you say it was a good exhibit room in the basement of the Unitarian Church I beg to differ with you. I didn't call it a good exhibit room with the people running up and down the stairs and continually disturbing the audience room, the audience jamming at the entrances and the doors slamming and the people talking out in the anteroom. It as very disagreeable to me. I believe you can have things right, and there isn't another society that I can think of anywhere in the state, however small it is, but what has got a home. Why shouldn't this State Horticultural Society have a home?

I claim that our State Horticultural Society has done more for the advancement of the interests of the state than any other one thing that I can think of. What would this state do if it didn't have the horticulture it has now? So if we are of a mind to think alike and the prospects are good, we will have a home over near the Agricultural School where we can have the co-operation of several hundred students. I want to get in touch with those students. I heard the four young gentlemen who gave us those splendid essays on horticulture. We can just as well have the co-operation of that school in various ways, and they need it. They need to come in contact with us, for the good we can do them and the good they can do us.

I was in hopes we would have a home to celebrate our fiftieth anniversary in, but we haven't got it, we didn't get it, and now let's put our whole force to work and get that home within the next two years. (Applause.)

The President: Our time is up now. I will turn this meeting over to the plant breeders' auxiliary and request the president, Mr. Clarence Wedge, to take the chair. Before that is done, however, I will make an announcement. Some two years ago we appointed a legislative committee to take this matter of a horticultural home before the legislature. This committee has made its report. There is still work to do and necessary, of course, to have either this committee continued or another appointed. What is your pleasure?

(It is moved and seconded that the present committee be continued.)

The President. The present committee is composed of Judge Crosby, Mr. Underwood and Mr. Yanish—

Mr. Underwood: And Mr. Cashman.

Mr. Latham: I think the committee was appointed by the executive board. Of course, it in entirely in order for this meeting to endorse the continuation of that committee and express its sentiments.

The President: It has been moved and seconded that the committee be continued, or rather, the recommendation of the executive board be endorsed. All those in favor say aye. Contrary no. The ayes have it, and it is so ordered.

Plant Breeders' Auxiliary.

The meeting of the Plant Breeders' Auxiliary was called to order by Mr. Clarence Wedge, president.

The President: Ladies and gentlemen, we now have one of the most important sessions of the meeting, one that gives as much hope as anything of improvement in our work and, inasmuch as the program is a very long one, I think the best thing for us to do is to get at it without delay. First on the program is the annual report for 1916 of the Minnesota Fruit-Breeding Farm, by Charles Haralson, superintendent.

Mr. Charles Haralson then read his report of work done during 1916 on the Fruit-Breeding Farm.

Discussion:

The President: We will now have to pass to our next subject, the report of the committee on the Fruit-Breeding Farm. The committee is composed of S. A. Stockwell, of Minneapolis, and C. S. Harrison, of Excelsior. We will call on Mr. Stockwell for the report.

Mr. S. A. Stockwell, of Minneapolis, then read the "Report of Committee on Fruit-Breeding Farm."

There follows Professor Beach's talk on "Fruit Breeding." (See Index.)

The President: We will next have the pleasure of listening to Professor C. B. Waldron of the Agricultural College of North Dakota, on "Pedigree in Plants." (See Index.)

The President: It seems necessary that we pass now to our next subject as we only have about half an hour and we all want to hear from Mr. Patten, of Charles City, on his work in the origin and development of hardy, blight-resisting pears. Mr. Patten. (Applause.)

Mr. Patten: I wish to say, Mr. President, and members, that had it not been for the action taken by this society last year in extending me the honor that it did, I should not have attempted to write a paper for this meeting. My nerves are not steady enough, and on reading my paper over since I came here I think my brain is not steady enough. It doesn't just suit me.

The President: It is all right, Mr. Patten.

Mr. Patten then read his paper on the subject of "Origin and Development of Hardy, Blight Resisting Pears." (See Index.)

The President: I see we have very little time to discuss this very interesting paper. We will now listen to Professor Hansen, of Brookings, South Dakota, who will tell us of new creations in horticulture for 1916.

Professor N. E. Hansen, of Brookings, South Dakota, then addressed the society upon "New Creations in Horticulture for 1916." (See Index.)

Mr. Wedge: It is now nearly quarter after twelve. While we are very glad to hear from Mr. Reeves I presume we better let that go until after dinner. The meeting will now stand adjourned.

Friday Afternoon Session.

The "Question and Answer" half hour was devoted to the discussion of the subject of "The Home Orchard," and was led by Mr. Henry Husser, of Minneapolis. (See Index.)

The regular program was then resumed with President Cashman in the chair.

The President: We will now continue with the regular program and will have a talk on the Minnesota orchard by Mr. J. F. Bartlett.

Professor R. S. Mackintosh is called to preside during President Cashman's absence.

Thereupon Mr. J. F. Bartlett, of Excelsior, read an address on "The Minnesota Orchard." (Applause.) (See Index.)

Discussion:

Professor Mackintosh: Mr. Barlett is one of the younger men that have gone to Excelsior, and we hope to hear more from him. The next number is an address on "The New Farmers' Fruit," by Mr. Freeman Thorp, of Hubert. He doesn't seem to be here, so we will call on Professor S. A. Beach, of Ames, Iowa, on "The Unfruitful Tree and How to Correct It." (Applause.)

"The Unfruitful Tree and How to Correct It," Professor S. A. Beach. (See Index.)

Discussion:

President Cashman now resumed the chair and announced the next number on the program.

Professor Richard Wellington, horticulturist, University Farm, thereupon read his paper upon "Orcharding in Minnesota." (Applause.) (See Index.)

The President: Does anyone want to ask Mr. Wellington any questions? If not we will proceed to the next subject, which by the way is about the last one on the program except some reports that are to be made. The next address will be given by Professor Mackintosh of the University Farm on "The Minnesota Apple Crop in 1916." (Applause.)

"The Minnesota Apple Crop in 1916," by R. S. Mackintosh, horticulturist, Extension Division, University Farm. (See Index.)

The President: There is just one thing we were unable to take care of during this entire session because of the lack of time and that is listening to the report of a fruit list committee. Mr. John P. Andrews is absent but Mr. Strand is here. He is a member of that committee, and I will ask him to come forward and make his report.

Mr. Strand: The fruit list for 1917 will remain practically the same as heretofore with the exception of a few changes which will be noted as I proceed. (See Index.)

We have stricken the Patten's Greening from the list of "Most Profitable Varieties," because the commercial planters of the state do not regard it as commercially profitable for several reasons. We have added the Superb and Salome to the varieties "For Trial" as they seem worthy to be tried. The Hungarian is a grape very much of the Janesville type but seems to be an earlier grape by about two weeks. It's a little better quality than the Janesville, but not quite as vigorous a grower as Beta. On the Americus everbearer it is suggested we take a vote of the society; there seems to be an inclination among a good many propagators to discard it and throw it out. I move the adoption of the report.

The President: You have heard the report of the fruit list committee and the motion that it be adopted.

Mr. Moyer: Some four or five years ago I suggested that the name "Duchess" be stricken out of the list and the word "Oldenberg" inserted, that being the official name given by the American Pomological Society, the name that is used in all the publications of the Department of Agriculture. It is the name that the tree is known by in Canada; it is the name that the tree is known by in the East, and just now there is coming from the press of the McMillan Company the great encyclopedia of horticulture by Professor Bailey, and it is spoken of there in that way. Although it is proper for us to have pet names for children I think we ought to use the technical official name in our publication, and so I would suggest to the committee that they drop the word "Duchess" and use the word "Oldenberg."

A Member: Do you make that as a motion?

Mr. Moyer: Yes, sir.

A Member: I second the motion.

Mr. Gardner: I move that we call it the "Duchess of Oldenberg."

The President: Do you accept the amendment?

Mr. Moyer: I don't like to because it is one of the rules of the American Pomological Society that fruits be given only one name. It is known as one of the most important apples in the East and they call it the "Oldenberg."

Mr. Latham: There are two sides to this. Even if we change this name on our fruit list, people who have that apple to sell can still call it the "Duchess" and the people who want to buy it can

call it the "Duchess." It does seem that in our publications we ought to conform to official names, but there is noting to prevent us putting in the word "Duchess" in parenthesis. The new name will gradually come into use; I suppose there is no question about that.

Mr. Kellogg: That is what I intended to suggest.

Mr. Rasmussen: I don't want to make any suggestion but to say something that occurred to me. During the fall the premium lists in our state and some of the neighboring states, which always used to call it the "Duchess," have changed to "Oldenberg." Once in a while they add the "Duchess" but I find it is generally changed to "Oldenberg."

Secretary Latham: I will put in the word "Duchess" in parenthesis, in the printed fruit list, whether you make the motion or not. (Applause.)

The President: Motion as it stands is that the word "Duchess" be changed to "Oldenberg." All those in favor say aye. Contrary no. The ayes have it and it is so ordered. Now, what will you do with the report, as amended?

Mr. Latham: I move its adoption.

(Motion is seconded.)

The President: It is moved and seconded that the report be adopted as amended.

Mr. Latham: I move that the variety of everbearing strawberry called the Americus be stricken from the list.

(Motion is seconded.)

The President: This motion is in order because the same gentleman who moved the adoption of the report moved its amendment. It is moved that the word Americus be stricken from the list of everbearing strawberries. All those in favor say aye. Contrary no. The ayes have it and it is so ordered.

(The motion to adopt the report is voted on and carried.)

The President: Is Mr. Reeves, of Waverly, present? Please come forward, Mr. Reeves, we have called on you several times, and you are the only gentleman from outside of the state we haven't had an opportunity to meet and get acquainted with. Mr. E. M. Reeves, of Waverly, Iowa.

Mr. Reeves: I am glad to be with you once more; I have been in attendance at the Minnesota meetings many times. The first time I was just a lad, and I remember the good time your members gave me. I recognize the pictures on the wall as the faces of those who were prominent then and others who came into prominence later. Mr. Harris and Mr. Elliot, especially, and Professor Green. They were three of those I especially remember when we held a meeting down near the river, in the old market building, I believe.

In the meetings since then I have felt the warmth of your friendship in many ways. At this time I met some that I hadn't seen for quite a number of years, and Mrs. Stager I want to mention especially, who has been with us this time. I formed

an acquaintance with her which I have valued because a cousin of my father's came here at a previous meeting to meet her, and we had a good visit while in attendance at the meeting, and while this cousin has grown old and unable to be here I was glad to hear of her again. There are lots of things, friends, that we can cherish. We can be glad of the friendship we form in our meetings above the actual knowledge that we gain. I am glad to have been with you and enjoyed one more meeting of the Minnesota Horiticultural Society, and especially on your fiftieth anniversary.

The President: I understand you have some inside information in regard to the Wealthy apple which I am sure would be interesting at this time.

The True Story of the Origin of the Wealthy Apple. By E. M. Reeves, Waverly, Iowa. (See Index.) It being after 4 o'clock a number of the members were called upon for short talks, and at 4:30 o'clock the meeting was closed by the president and declared adjourned sine die.

Records of Executive Board for 1917.

Record of meeting held in the Secretary's office, Dec. 4, 1916, 8 P. M.

All the members of the board were present except John P. Andrews. Secretary's accounts from June 15, 1916, to November 29, 1916, amounting to $1,623.48, were audited, and an order was drawn on the treasury for that amount.

Hon. Henry C. Oldenberg was recommended to the governor as a member of the state forestry board to succeed himself on that board as representative of this society. On motion of Mr. Clarence Wedge, it was declared to be the sense of the board that another effort should be made to secure from the legislature this winter an appropriation for a horticultural building.

The executive board decided to recommend to the society the following named persons for honorary life memberships: Martin Penning, H. J. Ludlow, Peter Clauson, John Penney, J. W. Murray, Miss Emma V. White, Mrs. Anna B. Underwood, Mrs. Jennie Stager.

Adjourned sine die.

J. M. Underwood, Chairman Executive Board.
A. W. Latham, Secretary.

Record of meeting held at West Hotel, Minneapolis, 12:30 P. M., December 8, 1916.

There were present at this meeting J. M. Underwood, Clarence Wedge, Thos. E. Cashman, LeRoy Cady, R. A. Wright, and A. W. Latham.

J. M. Underwood was elected chairman for the year 1917, and A. W. Latham was elected secretary at a salary of $1,800.00 per annum.

The salary of the treasurer was fixed at $25.00 per annum.

The subject of interesting the boys and girls of the state in the formation of a Junior Horticultural Society being under consideration, it was finally decided to leave the matter, with authority to act, with the so-called local committee, consisting of R. A. Wright, LeRoy Cady, Ed Yanish and A. W. Latham.

Adjourned sine die.

J. M. Underwood, Chairman Executive Board.
A. W. Latham, Secretary.

Record of meeting held in the secretary's office at 8:00 P. M., June 26, 1917.

There were present at this meeting Thos. E. Cashman, Prof. LeRoy Cady, Clarence Wedge, Edward Yanish and Secretary Latham.

The accounts of the secretary from December 1, 1916, to June 15, 1917, were examined and found correct, and an order was drawn on the treasurer in his favor for the amount, $3,955.34.

The secretary was instructed to secure a framed photo of the late L. R. Moyer to hang on the walls of his office.

An appropriation of $95.75 was made for the Minnesota Forestry Association to cover the amount due from that society for membership fees in 1917.

Adjourned sine die.

Thos. E. Cashman, Chairman ex-tempore.
A. W. Latham, Secretary.

The Executive Board in 1916.

J. M. UNDERWOOD, LAKE CITY, CHAIRMAN.

The Executive Board has held four meetings during the year. Reports of three of these meetings will be found in the bound volumes of our report for the year 1916. The last meeting of the Board was held on Monday evening (December 3, 1916) of this week. Your attention is called to the action of the Board in the appointment of a committee on the grading and packing of apples for market, consisting of Messrs. Wedge, Andrews and Wright, report of which will appear later in our monthly.

The Executive Board at its meeting Monday evening, passed a resolution commending the work that was done by the committee on securing a home for the society two years ago, and recommended that the committee be continued and submit to the legislature a bill for an appropriation, similar to the one of two years ago.

The splendid way in which our secretary has administered his office as usual leaves but little for the Executive Board to do, and we are glad to commend him for his faithful services.

Annual Report, 1916, Vice-President, Sixth Congressional District.

MATH. TSCHIDA, ST. CLOUD.

I sent out twenty-four letters to different fruit growers in my district, and received thirteen letters in reply. From these replies I compiled the following report:

Apples were, in general, not up to a full crop. Some of the growers report a good to very good crop, especially of Wealthy, Duchess, Hibernal and Malinda. Other varieties did not do so well. Other growers report only half a crop down to ten per cent. Some expected a good crop, but the flowers dropped from the trees on account of the frequent cold rains. Crab apples were almost a failure.

The plums have done much better than the apples. Quite a few reported a good to very good crop of plums. Some, however, stated that the blossoms were injured, and as a result they picked only half a crop. One or two only reported a complete failure.

It seems there are very few cherries grown in this district; and those that did report on them stated that the crop was a failure. Only two parties reported that they got a few cherries from their trees.

On grapes five parties reported that the crop was good to very good, but only the early varieties ripened their fruit. One stated that the Delaware and Niagara were the best. Another reported a great crop from the Alpha, while tame varieties were generally pretty good, but that the Concord was the poorest. Eight parties reported "None."

Only three parties reported on blackberries, stating that they got a good yield from their bushes. The other ten did not report any. Raspberries have done very well in general. Most of the reports speak of good to very good crops. Only two parties stated "very few to one-third of a crop." I have no raspberry plants myself.

Strawberries are grown almost throughout the entire district, and indications are that most all growers picked a good to very good crop. One stated his strawberries gave him an excellent yield this year. It seems there was no complete failure in strawberries this year. All got plenty of fruit. Only two parties reported on everbearing strawberries. One had a fine crop, the other a poor one. I am of the opinion that the ever-

bearers are good, but they ought to be planted every spring anew, and as early as possible.

It seems other fruits are not much grown in the district, as only one party reported a good crop of currants and gooseberries, while on the other hand another party had a poor crop. One stated that huckleberries and wonderberries did well at his place. I recommend the high-bush cranberries as a good bearer and it should be planted more generally.

Quite a quantity of nursery stock, namely apples, plums, raspberries, strawberries and other fruit, was planted this year with satisfactory results. In general blight was not reported as having been very prevalent. Some, indeed, reported a little blight, which they overcame by cutting out the affected branches. Two, however, reported much blight in their orchards, which has done a great deal of injury to their trees.

Very little spraying is done in our district. Three parties reported that they have sprayed their orchards seemingly with good results. The lime sulphur, copper sulphate and Bordeaux mixture were used.

The majority of the reports indicate the trees and shrubs did not suffer from last winter's cold, while a few indicated some injury to fruit trees, and one said that the trees were killed by frost. The conditions for wintering the trees safely are, in general, very good, and no injury is expected.

Varieties of fruits recommended by growers are as follows: Apples: Duchess, Hibernal, Okabena, Peerless, Charlamoff, Patten's Greening, Wealthy. Plums: Cherry, Wolf, Stoddard, Forest Garden, De Soto, Surprise. Grapes: Beta, Janesville, Salters, Niagara, Moore's Diamond, and Alpha.

For shrubs and flowers the following are mentioned: Phlox, petunia, peony, lilies, oriental poppies, pinks and many others. Then also, hydrangeas, lilacs, syringas, spireas, snowballs, caragana and golden leaved elderberries. Generally speaking, orcharding was not very profitable this year.

Annual Report, 1916, Vice-President, Seventh Congressional District.

G. A. ANDERSON, RENVILLE.

Of the twenty-five circulars sent out to different parts of my district, some being sent into every county, seventeen replies were received, which is considered good. On an average there has been about one-half crop of apples, some reporting less and others more. Considering that last year we had in some counties of the district a very large crop, this year was our off year for apples. The writer harvested last year over 1,200 bushels and this year about 500 bushels.

I believe that the upper Minnesota Valley is demonstrating that it is just as sure of a good crop of apples if not more so than parts of the state that are considered fruit centers. From information received I understand some of those soc-alled favored localities had a light crop, both last year and this year.

Apple trees are going into winter in good condition, with plenty of moisture in most places in the district, and an abundance of fruit buds for next year. The varieties recommended by the society are all doing well, the majority placing Wealthy and Duchess at the head of list. Prices for apples were very good during the season with a few exceptions.

The plum crop was light and some rot reported. Out of a dozen varieties grown by the writer, the Terry was the only one producing a full crop. The Opata and Sapa set a full crop, but at least one-half rotted before ripe. These varieties are excellent for canning purposes, not being so acid as most of our American varieties. Compass Cherry as usual rotted badly. Very few cherries, grapes and blackberries are grown in this district. The writer had some very nice Concord, Worden and Delaware grapes that ripened nicely.

Raspberries and strawberries were fair to good, the southwestern part of the district reporting drought reducing crops. My part of the district had an excess of moisture during the entire summer season.

A small amount of nursery stock was planted, but with good results, as the season was favorable for starting growth. With a few exceptions there has been no blight to speak of. Very little spraying has been done, but it is evident that more will have to be done if we are to raise marketable fruit, as scab especially was very bad this season, also some blotch. The writer sprayed

twice this season with soluble sulphur and arsenate of lead, but did not get good results, due perhaps to excessive rainfall during the time of spraying. There is danger of burning foliage where the soluble sulphur is used in connection with arsenate of lead. I had far better results last year with two sprayings of Bordeaux and arsenate of lead.

No injury resulted to trees or shrubs last winter, although we had some low temperatures, but there was an abundance of snow, and wood was well ripened, which accounts for no injury. Trees and plants are going into winter in good condition with plenty of moisture, except a few reporting ground rather dry.

List of fruits and ornamentals recommended by society are generally favored by all reporting, but few report growing any shrubs or flowers. This is a mistake as we have an abundance of hardy varieties to select from, and with a little extra care in covering choice roses can be grown. Of perennials we have the peonies, iris, phlox, lily of the valley and others that are very easy to grow. The writer has on his lawn an abundance of different shrubs, also peonies, iris, phlox, tulips, cannas, gladiolus and several varieties of choice roses. There is nothing that adds more to beautify a home than flowers. So when doing our planting let us not forget to plant some flowers even though they return nothing financially.

Amendments to Articles of Incorporation of the Minnesota State Horticultural Society.

The Articles of Incorporation of the Minnesota State Horticultural Society are amended to read as follows:

Any person may become an annual member of this society by paying to its secretary the annual fee of $1.00, or a life member by paying $10.00; except that members of local horticultural societies whose annual fee is $1.00 or more may unite in a body by the payment of twenty-five cents per capita, where the membership is from ten to twenty-five, or fifty cents where the membership is twenty-five or more.

The officers of this society shall be as follows: a president, one vice president from each congressional district, a secretary, a treasurer, a librarian and an executive board of six, all of whom shall be elected at the annual meeting of the society, except the librarian and the secretary, who shall be elected annually by the executive board. The president and secretary shall be, ex officio, members of the executive board. The secretary shall be, ex officio, librarian. All the above officers shall hold their office for one year, except the members of the executive board, who shall hold their office for three years, two members to be elected at each annual meeting.

The annual meeting of the society shall be held on the first Tuesday in December.

Anything in the said articles of incorporation inconsistent with the above amendments is hereby repealed.

J. M. UNDERWOOD, Pres.

Attest, A. W. LATHAM, Secy.

State of Minnesota, County of Ramsey, ss.

On this 15th day of February, A. D. 1895, before me, a notary public within and for said county, personally appeared J. M. Underwood, president of the Minnesota State Horticultural Society, who being duly sworn deposes and says that on the 12th day of January, A. D. 1895, the Minnesota State Horticultural Society, being in annual session, adopted by a two-thirds majority a resolution to amend the articles of incorporation of said society, in conformity with a new consttiution that day adopted, which amendments are hereto annexed.

J. J. LOMEN,
Notary Public Ramsey County, Minn.

J. M. UNDERWOOD.
President Minnesota State Horticultural Society.

A. W. LATHAM,
Secretary.

Additions to Society Library in 1917.

	Case.	No.
*Twelve Volumes—Methods and Discoveries. Luther Burbank	49	1-12
Game and Fish Commissioner of Minn., Bien. Rep. 1916	48	1
Apple in Canada, The. W. T. Macoun	48	2
The Story of the Soil. Cyril G. Hopkins	48	3
Wyoming State Board of Horticulture, Bien. Rep. 1915-16	48	4
N. H. Horticultural Society, An. Rep., 1909	48	5
N. H. Horticultural Society, An. Rep., 1910	48	6
N. H. Horticultural Society, An. Rep., 1912	48	7
N. H. Horticultural Society, An. Rep., 1913	48	8
N. H. Horticultural Society, An. Rep., 1914	48	9
N. H. Horticultural Society, An. Rep., 1915	48	10
Ont. Fruit Growers' Association, 1915	48	11
N. Y. Botanical Garden	48	12
Va. Horticultural Society, An. Rep., 1916	48	13
Northern Nut Growers' Association, An. Meeting, 1916	48	14
Ont. Vegetable Growers' Association, 1916	48	15
N. J. Horticultural Society, An. Rep., 1916	48	16
Nebraska Horticulture, 1917	48	17
Nova Scotia Fruit Growers' Association, An. Rep., 1917	48	18
Wisconsin Horticulture, 1912-1913	1	30
Wisconsin Horticulture, 1913-1916	1	31
Ill. Horticultural Society, An. Rep., 1916	48	19
Man. Horticultural and Forestry Association, 1916	48	20
Ont. Horticultural Society, An. Rep., 1916	48	21
Mass. Horticultural Society, An. Rep., Pt. 2, 1916	48	22
Mont. State Horticultural Society, An. Rep., 1915	48	23
Mont. State Horticultural Society, An. Rep., 1916	48	24
Minn. State Horticultural Society, An. Rep., 1916	44	14
Oregon State Horticultural Society, An. Rep., 1916	48	25
Md. Agricultural Society, Vol. 1, An. Rep., 1916	48	26
S. D. State Horticultural Society, An. Rep., 1916	48	27
Mich. Horticultural Society, An. Rep., 1915	48	28
Quebec Pomological and Fruit Growing Society, An. Rep., 1916	48	29
Mass. Horticultural Society, An. Rep., 1917, Pt. 1	48	30
Ohio State Horticultural Society, An. Rep., 1917	48	31
Minn. State Entomologist, Rep. 1915, 1916	48	32
Pa. State Horticultural Society, An. Rep., 1917	48	33
American Florists and Ornamental Horticulturists, An. Rep., 1916	48	34
Putnam's Garden Handbook. Mae Savell Croy	48	35
Modern Propagation of Tree Fruits. B. S. Brown	48	36
Nebr. State Horticultural Society, An. Rep., 1916	48	37
Putnam's Household Handbook. Mae Savell Croy	48	38
U. S. Dept. of Agriculture, Yearbook, 1916	48	39

MEMBERSHIP, 1917.

List of Annual Members Who are Voters in the Society.

The following list contains the names of those who are annual members for 1917 and have also been members for one or more immediately preceding consecutive years. Our constitution requires three years' consecutive membership to entitle to vote. Members whose names are in this list may vote at the 1917 annual meeting after payment of the annual fee for 1918.

Abbott, Geo. .....Newport
Abbott, T. A.....487 Ashland, St., St. Paul
Abbott, Geo.....Newport
Aberg, C.....3310 Winonah Pl., Mpls.
Abbott, Mrs. A. W...221 Clifton Ave., Mpls.
Abrahamson, E. O.....Lafayette
Ackerknecht, W. E.....
.....680 White Bear Ave., St. Paul
Ademmer B. Jr.....New Prague
Adams, Chas. W.....3212 Minnehaha, Mpls.
Adams, D. Albert.....Hutchinson
Adams, Robt. .....Morris
Aiton, Geo. B.....Grand Rapids
Almquist, C. A.....Capas
Alme, O. T.....Ulen
Allen, Edgar .....New Auburn
Allison, Prof. J. H....Univ. Farm, St. Paul
Albertson, A. R.....Paynesville
Alden, E. M.....Missable Ave., Virginia
Albrecht, O. E.....6th & Minn. Sts., St. Paul
Aldrich, C. D.....701 Kenwood Pkwy., Mpls.
Allen, Wilber R.....Wells
Allen, P. L.....1912 3rd Ave. So., Mpls.
Ames, Mrs. Frank.....Sta. F, Mpls.
Ammand, Ernest.....2812 Polk St., Mpls.
Anderson, Louis .....R. 1, Gladstone
Anderson., J. C. B.,
1285 Portland Ave., St. Paul
Anderson, Alex. P....Tower View, Red Wing
Andrew, Harry.....5327 Lyndale So., Mpls.
Anderson, Richard.....R. 4, Northfield
Anderson, J. E.....R. 5, Box 35, Hector
Anderson, Andy..935 Cherokee Ave., St. Paul
Anderson, J. W.....Mitchell, S. Dak.
Anvid, Olof .....Blackduck
Anderson, Axel.....Hotel Leamington, Mpls.
Andrews, Gen. C. C.....Capitol, St. Paul
Anderson, Miss Deborah..627 17th St. E., Mpls.
Anderson, John W.....R. 3, Cokato
Andrews, J. P.....Faribault
Anderson, S. A.....3801 Dupont No., Mpls.
Anderson, J. F.....Lake City
Anderson, Frank H...2905 Fremont So., Mpls.
Anderson, L. P. .....Bemidji
Anderson, Axel .....Dunnell
Anderson, Henry .....Lake Wilson
Anderson, Alf. O.....
.....522 York St. So., Wheeling, W. Va.
Anderson, Wm. ...1540 Kirwin Ave., St. Paul
Anderson, B. E.....Elbow Lake
Armitage, C. W. .....Canby
Arrowood, Jas. .....Nevis
Arness, A. G.....Benson
Archer, T. E.....Savage
Archer, Mrs. Marion.....Savage
Arctander, Ludvig .....
.....324 New York Life Bldg., Mpls.
Asp, Arthur E.....R. 1, Milaca
Asplund, Chas.....R. 1, Hopkins
Ash, H. C.....15 Carlyle Ave., Duluth
Atwood, H. J....1941 Waverly Ave., Duluth
Atcheson, Jas. .....Mapleton
Atherton, Mrs. Isabella.....Newport
Aune, Olof .....Underwood
Austin, Miss Mary J.....
.....503 Sellwood Bldg., Duluth
Austin, O. A. .....McVille, N. D.
Aune, Theo. .....Glenwood
Avery, Mrs. H. B.....Excelsior
Ayers, H. B. .....Kimberly

Bailey, J. Vincent.....
.....Dayton Bluff Sta., St. Paul
Bailliff, R. L.....Sta. F, R. 3, Mpls.
Baalson, H. E.....Brooten
Baglien, Hans H.....Rothsay
Bailliff, C. E.....Sta. F, R. 1, Mpls.
Bagley, Mrs. Horace.....Towner, N. D.
Bahe, H. G. .....Hastings
Babcock, Mrs. J. B.....Belgrade
Baldwin, H. J.....Northfield
Baker, H. F...4629 Lake Harriet Blvd., Mpls.
Baney, J. W. .....Blackduck
Baker, John W.....R. 3, Maynard
Bannister, I. C.....Stillwater
Banning, Mrs. J. F.....Mora
Baker, Bert .....Hoosick Falls, N. Y.
Bamford, Geo. J..1703 Sheridan Ave., St. Paul
Baker, Miss Ida A.....
.....4629 Lake Harriet Blvd., Mpls.
Balcarek, V. L.....Hyannis, Neb.
Baldus, Jos. L. .....Montrose
Bartram, Mrs. C. S.....R. 1, White Bear
Barnes, J. U.....705 Oneida Bldk., Mpls.
Barott, J. E.....Tamarack
Barker, Mrs. S. E.....R. 3, Excelsior
Bartlett, J. F. .....Excelsior
Bartholomew, O. A., Jr...120 5th St. So., Mpls.
Bartlett, Miss E. A.....R. 2, Hopkins
Bartholomew, R. L.....
.....Sta. F, R. 1, Nicollet Ave., Mpls.
Barrett, Miss Alice.....
.....Humbolt Ave. & 28th St., Mpls.
Bardwell, Fred L.....Excelsior
Barrows, Walter A., Jr....Hokendauqua, Pa.
Bartholomey, E. A...705 Germain St., St. Paul
Bates, W. K.....Stockton
Batho, Geo. .....
.....406 Maryland St. Winnipeg, Man.
Baxter, Hector.....4200 Park Blvd., Mpls.
Bazille, E. W.....605 Carroll St., St. Paul
Bawman, F. J..802 Edmund Ave. So., St. Paul
Bawman, Mrs. J. N.....Bricelyn
Bawman, Wm. .....Hayfield
Bathke, Fred.....496 Aurora Ave., St. Paul
Bass, Mrs. G. Willis....1811 Bryant No., Mpls.
Bayle, P. J.....Grand Marais
Bell, I. W.....Hopkins
Becker, E. W.....Excelsior
Becker, J. C.....Adrian
Bell, F. J.....Winona
Beatty, L. R.....Orr
Bemis, V. E.....Inkster, N. D.
Beise, Geo. W.....Morris
Beckman, J. F.....310 Webster Ave., St. Paul

Behrens, W. F.....New Richmond, Wis.
Bell, J. F. .....Wayzata
Bechtel, Esler R.....125 Cedar St., Hibbing
Belzer, F. L.....Glasgow, Mont.
Berthelson, Christ .....Albert Lea
Berglund, Robt. .....Kensington
Bend, C. M.....
.....Merchants' Nat. Bk. Bldg., St. Paul
Bergh, Otto I. .....Grand Rapids
Benner, T. W.....North St. Paul
Bergstrand, H....915 Lawson St. E., St. Paul
Benson, Andrew .....Jackson
Bergreen, Leslie .....Clarkfield
Bender, Louis .....Wheaton
Berdahl, A. A.....Gemmell
Benjamin, Mrs. J. F.....Hutchinson
Bethke, H. .....Franklin
Betchwars, Frank .....Jordan
Bessette, F. W.....Orr
Best, H. G.....Faribault
Bates, J. H.....
.....710 Somerset Blk., Winnipeg, Man.
Bauer, Edward .....Onamia
Bayly, Mrs. J. W., 2419 E. 2nd St. Duluth
Biermann, Henry .....Glencoe
Bickert, W. J.....Washburn, N. D.
Biggs, S. Elizabeth T.....Fairmont, N. D.
Bixby, Henry N.....Richville
Bill, Ambrose..984 Gorman Ave. W., St. Paul
Bjornberg, G. J.....Willmar
Bosshard, Herman .....Moorhead
Boardman, Mrs. H. A.....
.....589 Lincoln Ave., St. Paul
Bollmann, Paul .....Balaton
Boline, J. A.....Clarissa
Boelk, Ferd .....Lansing
Bock, John .....Wabasso
Bongie, Louis .....Bradley St. Sta., St. Paul
Bofferding, W. H.....
.....1423 Emerson No., Mpls.
Bondeson, Wm.....Walnut Grove
Bodreen, Chas. J.....R. 1, Stillwater
Bottenmiller, L. H.....Bertha
Bondhus, Thos. .....Storden
Borresch, Rev. Father.....Caledonia
Borning, B. J.....R. 2, Echo
Bonan, A.....2018 Superior St. W., Duluth
Boone, C. L.....
....Care Chase Bros. Co.,Rochester, N. Y.
Booth, Wm. .....Eagle Bend
Born, Otto G.....So. St. Paul
Bowman, Dr. F. C., 119 6th Ave. W., Duluth
Boyington, Mrs. R. P.....Nemadji
Bowen, Walter S.....347 Wabasha St., St. Paul
Boysen, P. B.....Steen
Bozja, Rev. Vincent.....Morgan
Boyd, Montelle M.....Stephen
Boyum, Iver A.....Northfield
Bourduas, Albert....1059 Crowell St., St. Paul
Boysen, Dr. P.....Pelican Rapids
Boyd, Byron .....Long Prairie
Brandt, P. A.....Erskine
Brand, A. M.....Faribault
Bradrud, Albert.....Spring Valley
Braden, Mrs. Chas. E.....Excelsior
Bradley, Geo. J.....Norwood
Bradley, Wm. .....Millarton, N. D.
Bradbury, W. W.....1724 E. 3rd St., Duluth
Brabetz, W. F.....915 3rd Ave. So., Mpls.
Brevig, A. L.....Starbuck
Briggs, H. W.....Sanborn
Briggs, Geo. A.....St. Peter
Bremer, John .....Lake City
Brevig, C. L.....Starbuck
Breyer, P. P.....3318 4th St. No., Mpls.
Brierley, Prof. W. G.....Univ. Farm, St. Paul
Bren, Daniel .....Hopkins
Bren, Rev. Jos.....Hopkins
Breening, H. C.....Balaton
Bremer, Leslie .....Cannon Falls
Brewer, I. C.....St. Charles
Breide, Fred .....Deer River
Brown, Frank .....Paynesville
Brown, Mrs. G. T...646 Hague Ave., St. Paul
Broberg, Peter .....New London
Broman, Aug. .....Atwater
Brunkow, Chas. A.....Delano
Brown, Aug. .....Winthrop
Broden, Gust A.....Murdock
Brown, H. A.....Brownsdale
Bruns, Henry .....Excelsior
Brooks, W. W.....Long Prairie
Brogen, Olof .....Willmar
Brodalen, H. A.....Pelican Rapids
Brown, Clarence Z.....
.....610 N. Y. Life Bldg., Minneapolis
Brown, Mrs. G. W.....St. Louis Park
Broman, Axel .....Milaca
Brodalen, G. A.....Ottosen, Ia.
Brumpton, Wm. .....Shevlin
Brown, Rev. Geo. W.....Wilson, Wis.
Brown, Clarence J. .....
.....629 Sec. Bk. Bldg., Minneapolis
Brown, Mrs. J. F.....2412 Garfield, Mpls.
Bugbie, A. E.....Paynesville
Buehler, John G..434 Main St. N. E., Mpls.
Bucholz, Aug.....R. A., Anoka
Bull, Geo. N...4116 8th St. W., Calgary, Can.
Buol, Peter .....Wabasha
Buckeye, J. .....Lakefield
Burow, W. P.....La Crescent
Burns, Mark.....Cass Lake
Burns, Chris .....Bemidji
Burquist, A. E.....Lindstrom
Burnett, John.....Torrey Bldg., Duluth
Burch, Edward P.....1729 James So., Mpls.
Burch, Frank E., 754 Linwood Pl., St. Paul
Bussey, L. M., 1814 Hamlin Ave. S. E., Mpls.
Busch, Bernard .....
.....Lyndale Ave. So. & 50th St., Mpls.
Buth & Co., W. F...298 Univ. Ave. St. Paul
Butterfield, F. J.....Long Lake
Bute, Chas. M.....R. 4, Jackson
Byrnes, Dr. W. J.....Masonic Temple, Mpls.
Bye, C. M.....New Brighton
Bye, J. T.....New Brighton
Byrne, Mrs. M. E.....
.....6544 Lafayette Ave., Chicago

Cairns, Miss Gertrude M.....Ellsworth, Wis.
Cant, W. A.....1231 3rd St. E., Duluth
Campbell, E. R.....Excelsior
Canniff, Mrs. Laura J.....
.....185 Brompton St. W., W. St. Paul
Canning, Richard....Orchard Gardens, Mpls.
Cadoo, H. T...988 Corman Ave. W., St. Paul
Cadwell, B. D.....Box 295, Hastings
Cady, E. M.....Lewiston
Campbell, Mrs. H. A.....55 4th St. E., St. Paul
Carlson, C. H.....Fertile
Carmen, C. A.....Hankinson, N. D.
Carlson, And. .....Grandy
Carlson, C. W. .....Mound
Carpenter, F. H.....121 Franklin W., Mpls.
Carnahan, E. J.....Longville
Carlson, Mrs. Wm., 6005 London Rd., Duluth
Carpenter, M. B.....Hotel Aberdeen, St. Paul
Carlson, Peter .....Mohall, N. D.
Carlson, J. A.....3410 18th Ave. So., Mpls.
Carlson, Axel..Manhattan Bldg., Fergus Falls
Carver, J.....2412 17th Ave. So., Mpls.
Carlson, G. C. .....Tower
Catlin, T. J., M. D.....Palisade
Cash, W. H. H.....New Lisbon, Wis.
Case, L. S.....Mer. Nat. Bk. Bldg., St. Paul
Cecil, R. E.....Gen. Del., McKeesport, Pa.
Charlson, S. .....Dennison
Chapman, H. H.....
.....360 Prospect St., New Haven, Conn.

Chamberlain, V. M.....Spring Valley
Chalgren, Chas. .....Kandiyohi
Chapman, C. P.....Dent
Chatfield, Mrs. E. C.....Mound
Chamberlain, W. G.....Albert Lea
Chapman, Ed. A.....Redwood Falls
Chamberlain, Louis M.....
.....54th St. & Pillsbury, Mpls.
Chamber of Commerce.....Brainerd
Christopherson, K. O.....Zumbrota
Christopherson, Chris.....Camden, Pl., Mpls.
Cherney, J. W...Winslow & Arion Sts., Mpls.
Chrudinsky, Mrs. Robt. J.....Lakewood
Chinn, W. P.....Gilbert
Cheyney, Prof. E. G.....Univ. Farm, St. Paul
Chute, L. P.....7 Univ. Ave. N. E., Mpls.
Christman, W. F.....3804 5th Ave. So., Mpls.
Christenson, Christ.....R. 3, Albert Lea
Chermack, W. R.....Hopkins
Cherveny, John J.....Zimmerman
Chelmen, B. E.....Georgeville
Christenson, C. G.....Deerwood
Chemak, Otto.....R. 1, Hopkins
Chirstensen, M...951 Goff Ave., W. St. Paul
Christensen, Aug. .....Little Falls
Christy Color Printing & Eng. Co.....
.....179 St. Paul St., Rochester, N. Y.
Cinkl, Albert.....Blooming Prairie
Clemons, L. A.....Storm Lake, Ia.
Cleator, Frederic W.....Republic, Wash.
Cleveland, Henry.....City Hall, Duluth
Clasen, Mrs. Peter.....Maple Plain
Cleator, W. P....1400 Wash. Ave. N., Mpls.
Clark, Mrs. A. Y.....Box 237, White Bear
Clague, Frank.....Redwood Falls
Clark, R. J.....Eden Prairie
Clark, Geo. S.....27 5th Ave. So., St. Cloud
Clement, C. C.....Mosier, Oregon
Clark, H. B.....Pine Island
Clark, D. F.....2110 Bryant So. Mpls.
Collings, Jas. H.....Inkster, N. D.
Constance, Wm. .....Hopkins
Colburn, Otis L.....Excelsior
Congdon, John S.....R. 5, Fort Collins, Colo.
Coffin, E. C.....2449 Garfield Ave., Mpls.
Cobban, Walter H.....
.....1505 Shady Ave., Pittsburgh, Pa.
Conrad, Maude A.....Montevideo
Congdon, J. W.....2620 Blaisdell, Mpls.
Colburn, G. B.....R. 6, St. Cloud
Conzet, Grover .....Eufaula, Ala.
Colby, F. L.....Enfield, N. H.
Coleman, D. A.....R. 2, Aitkin
Constance, Geo. I.....Cumberland, Wis.
Cobb, E. R. .....175 Winona St. E., Duluth
Cook, A. D.....225 Kasota Blk., Mpls.
Cornwell, E. C.....Minnesota City
Cornell, T. H.....815 Fidelity Bldg., Duluth
Cook, Geo.....Menahga
State College of Agri., Cornell Univ. Library,
.....Ithaca, N. Y.
Cowles, F. J.....West Concord
Coultas, R. W.....Worthington
Cote, L. .....Grasston
Covington, Thos. E.....
.....1793 Ashland Ave., St. Paul
Countryman, Mrs. M. L.....
.....213 Avon St. So., St. Paul
Coy, Sherman L.....Cloquet
Cox, Wm. T.....61 St. Albans St. So., St. Paul
Cox, L. A.....436 Syndicate Blk., Mpls.
Court, Harry .....Warroad
Cramer, Fred .....Mapleton
Crafts, Robt. H. .....Mound
Craig, Ed.....Esmond, N. D.
Crane, W. I.....
.....810 Burch St., Richmond Hill, N. Y.
Crewe, Percy S.....Mohall, N. D.
Crowell, Dr. I. G.....Shell Lake, Wis.
Crumer, Dr. Geo. P..636 Syndicate Bldg., Mpls.
Crooks, Mrs. John S.....
.....1980 Montreal Ave., St. Paul
Crooks, John S..1980 Montreal Ave., St. Paul
Cuzner, E. A.....
.....Univ. Ave. & 13th St. S. E., Mpls.
Cutting, S.....Carnegie, Man.
Cutler, John .....Glencoe
Curran, Dr. F.....2612 13th Ave. So., Mpls.
Cushing, Luther S.....Osceola, Wis.

Dahl, Louis D.....Atwater
Dahlen, O. E.....Albert Lea
Dahl, F. A.....Chisago City
Dale, O. G.....Madison
Dahlheimer, Frank .....Anoka
Dadant, H. C.....Hamilton, Ill.
Daniel, T. W.....R. 1, Wayzata
Dahlquist, C. A.....Popple
Dahl, Mrs. A. O.....
.....490 4th St. W., Superior, Wis.
Day, Stephen H.....Northfield
Davison, A. H.....
.....1324 9th St. E., Des Moines, Ia.
Darling, Dr. C. H.....
.....697 Endicott Arcade, St. Paul
Darrow, Geo. M.....
Bureau of Plant Industry, Washington, D. C.
Davenport, W. R.....Dennison
Deline, W. F.....Cannon Falls
Decker, J. S. .....Austin
De Long, T. R.....Halliday, N. D.
De Forest, Geo. .....Owatonna
Deighton, C. H., 902 Wolvin Bldg., Duluth
Deatherage, Mrs. Robt.....
.....2428 Portland Ave., Mpls.
Deebach, Herman....138 4th St. E., St. Paul
Deebach, E. A.....Dayton Bluff Sta., St. Paul
De Lameter, Mrs. J.....Maple Plain
Derickson, G. P..238 Franklin Ave. W., Mpls.
De Puy, A. C.....Bemidji
Dexter, Mrs. W. K.....Mound
Devore, F. J.....972 Robert St. So., St. Paul
Diethelm, M. .....Victoria
Dittbenner, R. C.....Sleepy Eye
Dickenson, W. C.....Anoka
Dixon, Jas. K.....R. 6, No. St. Paul
Dille, Peter O.....Dassel
Dike, Henry B.....Hotel Berkeley, Mpls.
Dittmer, Gus.....Augusta, Wis.
Dillman, A. C.....Newell, S. D.
Dickey, Mrs. G. H.....Esmond, N. D.
Dist. Inspector of Forest Reserve.....
.....Winnipeg, Man.
Dill, Albert.....St. Bonifacius
Doll, P. J.....2303 Bryant No., Mpls.
Dodge, Clayton J.....Moose Lake
Doerfler, Jas.....Laurel, Mont.
Dobble, Mrs. Edwin.....
.....1385 Raymond Ave., St. Paul
Dobbs, David E.....Indus
Dowler, W. A.....Fort William, Ont.
Dorr, W. G.....1132 Lbr. Ex., Mpls.
Dorland, W. H. .....
.....Dayton Bluff Sta., R. 4, St. Paul
Downing, W. J.....R. 2, Ronneby
Downing, Lloyd.....St. Charles
Dowd, J. J.....303 Medical Blk., Mpls
Drake, Mrs. H. T...435 Portland Ave., St. Paul
Drisko, Mrs. E. M.....3913 Garfield, Mpls.
Dressely, L. J.....Gatzke
Durand, Albert .....Waseca
Dunn, John W. G..1033 Lincoln Ave., St. Paul
Dunn, W. W.....397 Bates Ave., St. Paul
Dubbells, Joe .....Lincoln
Dunning, Frank .....Anoka
Dunsmore, Henry, Jr.....Olivia
Dunsmore, Dr. F. A...100 Andrus Bldg., Mpls.
Duncan, Alvin.....Redwood Falls
Dubbels, Chas. W.....Viola

Duerr, Dr. W. P.....Lake City
Durham, Sabin .....Roseau
Dybvig Nursery.....Colton, S. D.

Earle, C. E.....Park Rapids
Eaker, E. C.....Marshall
Eberhart, A. L.....Austin
Ebersperger, Mrs.....2008 Girard No., Mpls.
Eckenbeck, S. C.....Appleton
Eckberg, Aug. .....Winthrop
Eddy, C. T.....R. 4, Willmar
Edwards, Frank .....Gilbert
Edgerton, Mrs. E. A...2720 Bryant So., Mpls.
Effertz, Peter .....Norwood
Egnell, A.....Howard Lake
Eisenach, Walter .....Aitkin
Eklund, P. A.....Willmar
Ellison, F. H.....55th & France Ave., Mpls.
Elliot, W. J.....Albertville
Ellingson, S.....Sta. F, R. 4, Mpls.
Elstrom, F. O.....Atwater
Elliot, P. P.....Grand Rapids
Elwell, J. T.....945 14th S. E., Mpls.
Ellison, Miss Sabra M.....
.....Sta. F, R. 2, Linden Hills, Mpls.
Elofson, J. S.....Hasty
Elsenpeter, H. J.....Buffalo
Emmans, N. H...1736 James Ave. So., Mpls.
Emberland, John....1989 Selby Ave., St. Paul
Empy, Clarence L.....Eureka
Emerson, Byron T..4314 Grimes Ave., Mpls.
Endsley, P. M.....Deceased
Engel, A. W.....1456 Leland Ave., Chicago, Ill.
Engel, Rev. Peter.....Collegeville
Engman, A. E.....R. 1, Hallock
English, Mrs. C. E.....
.....2691 Lake of Isles Blvd., Mpls.
Engen, Gilbert A.....R. 1, Finley, N. D.
Enerson, A. F.....Grand Portage
Engel, A. W.....Esmond, N. D.
Enroth, A. L.....Orr
Erwin, D. A.....Waseca
Erkel, F. C.....Rockford
Erickson, Oliver .....Atwater
Erne, F. X.....887 Coff Ave., St. Paul
Erikson, John W.....Aitkin
Erikson, C. O.....Box 182, Watson
Erb, E. C.....Red Wing
Erling, Frank, Jr.....
.....37 Belvidere St. W., W. St. Paul
Erickson, A. B..114 Mill St. No., Fergus Falls
Erickson, Wm. M.....Court House, Red Wing
Erickson, L. W.....4541 35th Ave. So., Mpls.
Erickson, May.....2522 10th Ave. So., Mpls.
Essig, Aug. .....Sanborn
Essene, Mrs. Anna.....
.....3421 Longfellow Ave., Mpls.
Eshelby, E. C.....400 Shubert Bldg., St. Paul
Evans, John L.....424 2nd Ave. E., Duluth
Ewing, Prof. A. L.....River Falls, Wis.
Ewing, Prof. Jas. .....Northfield

Fairfax, Mrs. J. F.....
.....4859 So. Aldrich Ave., Mpls.
Fagerlie, I. F.....Clarkfield
Fabian, Edwin....1914 Jefferson Ave., St. Paul
Fairchild, D. L...500 Lonsdale Bldg., Duluth
Fairfield, Chas. R....1313 4th Ave. So., Mpls.
Farrar, F. F.....White Bear
Farmer, C. R.....Ada
Fanning, Miss Mary G.,
756 E. 6th St., St. Paul
Farmer, E. A.....Sta. F, R. 2, Mpls.
Farnham, Jas. M..114 1st St. S. E., St. Cloud
Featherstone, S. T.....Red Wing
Felland, Prof. O. G.....Northfield
Fergeson, W. C.....Litchfield
Feesl, Vinz...cor. Winslow & Arion, St. Paul
Fell, Henry.....R. 6, Janesville

Fesenbeck, J. A.....Cloquet
Fitzer, Chas. .....Robbinsdale
Fink, Christian.....R. 1, Waconia
Fisher, Geo. A.....221 1st St. No., Mpls.
Finkle, Miss Kate....2760 River Rd. W., Mpls.
Fischer, W. C.....Brookside Terrace, Mpls,
Fitzer, H. .....Luverne
Fish, L. L.....R. 2, Wayzata
Fisher, Walter F.....2432 Girard So., Mpls.
Finnegan, Pat.....Thorp, Wis.
Fisher, Thos. A.....Waverly Hotel, Mpls.
Flagstad, J.....Sacred Heart
Flint, Henry W.....R. 4, Tacoma, Wash.
Flood, E. J.....Newman Grove, Nebr.
Floreen, Swan .....Constance
Flygare, Hans H.....Atwater
Flathers, J. W.....Rochester
Ford, F. H.....R. 3, Maple Plain
Ford, A. J.....New Rockford, N. D.
Foss, Elizabeth H....501 River Rd. E., Mpls.
Fosner, Clarence .....Watson
Forest Supervisor .....Ely
Forest Supervisor .....Cass Lake
Foley, T. H.....Manchester
Folske, Otto H...132 Lucy St. W., W. St. Paul
Foster, Mrs. Mary D.....Foley
Fritcher, C. E.....Hancock
Frye, P. H.....Willmar
Freeman, Gust E.....Red Wing
Freeman, C. H.....Zumbrota
Fridholm, Martin.....Albert Lea
Fredrickson, Wm. .....Perley
Frank, Albert D.....Wood Lake
Frederickson, C. A.....R. 3, Elk River
Freese, F. M.....Bemidji
France, Prof. L. V., 2304 Priscilla, St., St. Paul
Fryer, Willis E.....Mantorville
Franklin, Mrs. Anna J.....R. 1, Fridley
Fry, Math. .....Taunton
Fry, Frank .....Taunton
Fratke, Julius .....Pemberton
French, W. L.....Manhattan, Kan.
Freeman, Nels .....Scanlon
Fraling, Rev. J.....Stephen
Freeman, Edmund.....Park Rapids
Freund, Mrs. S..73 Western Ave. N., St. Paul
Fuller, E. D.....3521 Longfellow So., Mpls.
Fulcrut, S. G.....R. 5, Goodhue
Fyfe, H. L..1316 12th Ave W., Calgary, Can.

Galloway, J. E. .....Austin
Gammell, Dr. H. W.....Madison
Gallatin, John M.....
.....887 Gorman Ave., W. St. Paul
Gastfield, A. F.....R. 1, Victor, Mont.
Garlick, Eva E.....Janesville
Gaspard, J. P.....Caledonia
Gates, L. D.....Winnebago
Gaylord, L. E.....981 Pacific Ave., St. Paul
Ganzer, Mrs. John.....Como Phelan, St. Paul
Gates, Stephen.....R. No. 3, Hopkins
Gantzer, Daniel.....R. 1, Merriam Park
Gesner, Frank.....397 Brimhall St., St. Paul
Gerdsen, Henry .....Deceased
Gearty, T. G.....Robbinsdale
Gessner, Oscar.....R. 2, Forest Lake
George, E. S.....Graetlinger, Ia.
Germond, Miss M....3805 Elysian Ave., Duluth
Gerten, Frank L.....So. St. Paul
Gerlach, Mrs. A. F....1265 Dayton, St. Paul
Gerber, A. H....1594 Portland Ave., St. Paul
Gerhard, Ray C.....2722 Bryant So., Mpls.
George, R. R.....3615 Stevens Ave., Mpls.
Gertsmann, Frank .....Morgan
Getty, D. C. .....Mapleton
Gibbs, Miss Ida W.....
.....R. 1, Box 107, Merriam Park
Gibbs, A. B. .....Tower
Gibson, Murdo.....239 Victoria, Duluth
Gibbs, M. L.....R. No. 2, Echo

Gibson, Thos.....1907 Waverly Ave., Duluth
Gimmestad, M. O.....Belview
Gippe, Miss Louise.....Watson
Gile, Mrs. S. A.....3136 Irving So., Mpls.
Gilby, Jas.....3204 16th Ave. So., Mpls.
Gilmer, Bert.....Howard Lake
Gillespie, Mrs. Anna..2528 38th Ave. So., Mpls.
Gipson, E. H. .....Faribault
Glyer, Alfred.....Forest Lake
Glessner, Mrs. Frank.....
.....3840 Sheridan Ave. So., Mpls.
Glenzke, Louis M.....Glen Lake via Hopkins
Goodman, D. E.....Faribault
Gooch, H. I.....3808 Woodland Ave., Duluth
Goetz, Edgar A....2186 Doswell Ave., St. Paul
Gould, Mrs. E. W.....2644 Humbolt So., Mpls.
Gormley, J.....2727 Taylor St. N. E., Mpls.
Gordon, W. A.....627 2nd Ave. So., Mpls.
Gorham, D. E.....Warroad
Gordon, C. H.....Owatonna
Goltz, A. L.....Balaton
Gowdy, Miss Chestine.....Faribault
Gray, Elmer W.....3443 Pleasant Ave., Mpls.
Graves, D. N.....Faribault
Grasselli Chemical Co.....St. Paul
Granger, A. H.....Correll
Grant, Harry C.....Faribault
Graham, L. G.....Sta. F, R. 1, Mpls.
Gregory, H. .....Jordan
Green, Wm. .....Morgan
Greene, Michael E.....617 Warren St., St. Paul
Green, John C.....4730 London Rd., Duluth
Gregg, Kenneth .....112 Lbr. Ex., Mpls.
Groat, H. G.....Anoka
Grimm, Ben.....2418 E. 4th St., Duluth
Gross, E. A.....La Moille
Grover, Gust A.....Glyndon
Grunig, A. C.....Cloquet
Grinder, Oscar.....R. 4, Elbow Lake
Griese, E. T.....Hibbing
Griffith, Edith.....1307 4th Ave. So., Mpls.
Gronna, A. T.....Waterville, Ia.
Grindeland, A. .....Warren
Gunderman, H. .....Wabasha
Gustafson, Alf.....Long Prairie
Gundlach, Miss Carrie M.....White Bear
Gunn, D. M.....Grand Rapids
Gustafson, Frank A.....Warman
Gustner, E.....R. 3, Hopkins
Guthnecht, B....879 Oakdale Ave., W. St. Paul
Gullette, Albert..2522 Fillmore St. N. E., Mpls.
Gunderson, G.....Box 127, Webster, S. D.
Guthunz, Mrs. W. M.....
.....1637 Hague Ave., St. Paul

Hakel, Adolph.....Silver Lake
Haack, Chas. E.....Mound
Hagen, F. A.....Lake City
Hage, Paul J.....Hanska
Haecker, Prof. F. L.....
.....St. Anthony Park, St. Paul
Haas, Rev. L.....5115 9th St., St. Paul
Haeg, Mrs. E. H.....R. 1, Sta. F, Mpls.
Haglund, O. N.....Eastwood
Hagen, Severt .....Waseca
Halverson, Alfred.....Spring Grove
Hall, R. F.....New Auburn
Hall, L. P.....Deerwood
Halden, F. E.....Mound
Halverson, L. .....Shevlin
Halverson, Jacob .....Delavan
Halversen, A. S.....Albert Lea
Halverson, Martin J.....Medina, N. D.
Hall, Stanley .....Grygla
Handy, A. M.....Granada
Hanson, Jas. F. .....Fertile
Hanson, C. L. .....Fertile
Hammer, M. E. .....Heiberg
Hanson, L. O. .....R. 3, Red Wing
Hanson, A. L .....Ada

Ham, Geo. S.....R. 2, Aitkin
Hanson, H. C. .....Barnum
Hansen, Phil .....Capitol, St. Paul
Hanson, Ivar .....Clarissa
Hanford, Arthur..2027 Woodland Ave., Duluth
Hanson, N. P. .....Hutchinson
Hanson, M. C. .....Clarkfield
Hanover, R. F. .....Winona
Hanuf, Adolph .....R. 2, Hopkins
Hanna, M. M.....D. & I. R. Ry., Duluth
Harrison, F. M.....Glenwood
Harrison, H. W.....Rochester
Hartman, Frank .....Iona
Harold, Geo. E.....Maiden Rock, Wis.
Harper, J. L.....Lock Box 1006, Mpls.
Hassan, N.....Box 24, Glencoe
Harris, W. S.....2449 Pillsbury Ave., Mpls.
Harnden, C. H.....Fairmont
Hardwick, Mrs. B. G..4419 Fremont So., Mpls.
Hastings, C. C.....Buffalo
Hart, Frank W.....Laporte
Harris, Earl .....Litchfield
Haseltine, Mrs. E. R.....Excelsior
Harper, Stanley J.....Box 1625, Mpls.
Harris, Van V.....Ely
Hawkins, Mrs. Alice M.....
.....1523 Fremont No., Mpls.
Hathaway, C. E.....Northfield
Hawkins, J. S.....1523 Fremont No., Mpls.
Hawkes, A. S.....Waseca
Hatcher, Frank .....Wayzata
Hatledal, Ole O.....Benson
Hawkins, G. C.....2913 Fremont So., Mpls.
Hawkes, H. B.....Excelsior
Hattenberger, Tony .....Shakopee
Hayden, Chas. .....Blackduck
Hawkins, John .....R. 3, Merriam Park
Hawkins, Mrs. G. C..2913 Fremont So., Mpls.
Hauenstein, Mrs. Regina.....R. 1, Excelsior
Hayes, Chas. H.....Clarissa
Hazelton, D. C.....Cutler
Heineman, R. E.....Montevideo
Hegerle, M. H.....Deceased
Heimel, Geo.....So. St. Paul
Hegland, A.....2018 W. Superior St. Duluth
Helgeson, C. T.....Albert Lea
Hellyar, A. B.....1718 Chicago Ave., Mpls.
Heckle, Jos.....976 Bellows St., W. St. Paul
Heller Bros.....Albee, S. D.
Headman, P. W.....Henning
Hector, Chas. J.....1209 2nd St. E., Duluth
Heagy, Ralph.....
.....1687 Minnehaha St. W., St. Paul
Healy, Mrs. R. J.....2105 Irving So., Mpls.
Hekkila, Oscar .....Ely
Heinze, Jake .....Lewiston
Henjum, Nels .....Frost
Henderson, H. G.....Lime Springs, Ia.
Hendrickson, M. P.....Montevideo
Henke, Gust.....Buffalo Lake
Henkel, Peter J.....Watkins
Hemphill, Henry .....Pillager
Henry, Mrs. M. J.....
.....1895 Iglehart Ave., St. Paul
Hesselgrave, R. V.....Winnebago
Hershaug, Ed. .....Kenyon
Herman, A. C.....1613 Van Buren St., St. Paul
Herscher, Lawrence .....Renville
Herman, Jos...Sunfish Lake Rd., W. St. Paul
Herda, John W.....Lonsdale
Hilborn, E. C.....Valley City, N. D.
Hidde, Fred .....Herman
Hillger, Rev. Aug.....Rosemount
Hill, W. W.....146 48th St. W., Mpls.
Hill, F. C.....Albert Lea
Highby, L. P. H.....Albert lea
Hillman, Wm. O.....396 Dewey Ave., St. Paul
Hiller, Eric.....care F. B. Snyder, Excelsior
Hibbard, Mrs. C. J.....412 Nicollet Ave., Mpls.
Higley, O. K.....1808 Girard No., Mpls.

Hicks, Fred C.....
.....1022 Court Merrill, Mitchell, S. D.
Hidershide, Dr. Geo. N.....Arcadia, Wis.
Hintermister, J. H...563 Wabasha St., St. Paul
Hines, Ed.....2431 Lincoln St. So., Chicago
Hitchcock, F. E.....768 Osceola Ave., St. Paul
Hinkle, B. J.....Little Falls
Hirt, John H.....4430 34th Ave. So., Mpls.
Hjermstad, C. F.....Red Wing
Hjermstad, H. L.....Red Wing
Hofmann, E. L.....Janesville
Hoffman, Rev. C.....Bruno, Sask.
Hoffman, H. R. .....
.....526 5th Ave. So., Wausau, Wis.
Hoffman, Geo. J.....Long Lake
Hobbs, Arnold....610 N. Y. Life Bldg., Mpls.
Holt, John E.....Carver
Holmgren, P. O.....Hoffman
Holten, John .....Fertile
Holmberg, J. A.....1241 Edgerton St., St. Paul
Holmes, Mrs. Jas. T.....R. 1, Northfield
Holt, John .....Wolverton
Hollingsworth, Ralph .....
.....1107 13th Ave. S. E., Mpls.
Holland, Ozra S.....R. 1, Winona
Holtmeier, John H.....Excelsior
Holasek, Winslow .....Hopkins
Homola, Frank J.....R. 3, Hopkins
Holstad, Hans....920 St. Olaf Ave., Northfield
Horton, W. H.....Alexandria
Hornby, H. C.....Cloquet
Hostetter, A. B.....1810 E. 4th St. So., Duluth
Hoverstad, A. T. .....Maynard
Howland, Clinton J.....Northfield
Howland, Mrs. Eleanor..5802 Pleasant, Mpls.
Hoss, Mrs. Nick.....New Ulm
Hove, John I.....Northwood, Ia.
Howard, Geo. F..1281 Raymond Ave., St. Paul
Hoyt, Edward.....Scotch Grove, Ia.
Houghton, Jas. G.....3129 Clinton Ave., Mpls.
Howlett, Mrs. D. D.....R. 5, Oshkosh, Wis.
Hosmer, Ralph S..Cornell Univ., Ithaca, N. Y.
Horton, G. L.....Litchfield
Horlacher, F. S.....Tappen, N. D.
Hoppert, Walter O..R. 1, Box 198, W. St. Paul
Hoover, J. L.....R. 2, Kensal, N. D.
Horn, Chas.....244 Lewis St., Duluth
Hoyt, L. H. .....Fridley
Hoyt, R. A. .....Lake City
Huestis, Dr. O. M.....400 Central Ave., Mpls.
Huff, Theo. A.....Fergus Falls
Huber, Frank .....Shakopee
Hull, F. H.....Brook Park
Hubbell, C. H.....917 Marquette Ave., Mpls.
Huffman, Mrs. E. J.....Nemadji
Huber, Rev. A. T.....New Plymouth, Ohio
Hughes, H. J.....
.....care Farm, Stock & Home, Mpls.
Hulbert, A. M.....Elk River
Huey, W. G.....Wyndmere, N. D.
Hultquist, Esther M.....
.....The Knudsen Fruit Co., Duluth
Hubbard, W. A.....Lake City
Huldal, H. F.....R. 1, Wilton
Hummel, Prof. J. A.....
.....2143 Commonwealth, St. Paul
Hurtt, Wm.....Hoople, N. D.
Hundt, G. .....Tintah
Humphrey, D. A.....3624 Blaisdell, Mpls.
Hushka, Joseph .....Felton
Hurd, Burton....652 So. Smith Ave., St. Paul
Hybergh, S. .....Hamel

Isaacson, And. .....Barrett
Ingebrigtsen, Iver J.....Fertile
Ingmundson, R. P.....
.....121 2nd Ave. So., Jamestown, N. D.
Innis, Geo. S.....Hamline Univ., St. Paul
Ihfe, Fred..301 Brompton St. W., W. St. Paul
Irving, John N.....So. Park, St. Paul

Jackson, P. T.....1722 Summit Ave., St. Paul
Janzen, Abr.....Mt. Lake
Jackson, Peter .....Cloquet
Jacobson, J. F.....Madison
Jager, Rev. Francis.....St. Bonifacius
Jackson, James .....Woodstock
Jacobs, Dr. J. C.....Willmar
Jasmer, Paul A.....Winona
James, Dr. A. C.....Springfield, Ill.
Jacobson, Norman G.....
.....Beck Bldg., Portland, Ore.
James, J. Willis..1863 Lincoln Ave., St. Paul
Jackson, Geo. R.....Manchester, N. H.
Jamison, Robt. .....Excelsior
Jackson, J. F.....216 Lbr. Ex., Mpls.
Jensen, A. P.....Box 84, Askov
Jerabek, Mrs. Mary.....Excelsior
Jensen, Jens A. .....Rose Creek
Jensen, Adolph....3315 17th Ave. So., Mpls.
Jensen, J. P.....Morgan
Jensen, C. M.....Albert Lea
Jedlicka, Henry.....R. 3, Eagle Bend
Jensen, Anton .....McIntosh
Jenson, Jens H. .....Box 314, Hudson, Wis.
Jennison, Mrs. Jas...4224 Fremont So., Mpls.
Jenson, N. A. .....Willmar
Jensen, L. .....Clearbrook
Jepson, Mrs. J. H.....1600 Girard No., Mpls.
Johnson, P. G.....3390 Elliot Ave., Mpls.
Johnson, Dr. A. E. .....Cloquet
Johnson, E. A. .....Maple Plain
Johnson, Fred .....Plainview
Johnson, L. T. .....Spring Grove
Johnson, C. B. .....New Richland
Johnson, P. E. .....North Branch
Johnson, Arnt .....R. 2, Viroqua, Wis.
Johnson, Henry V.,
614 E. Lawson St., St. Paul
Johnson, J. H. .....Doon, Ia.
Johnson, C. A. .....R. 1, Box 48, Ogilvie
Johnson, Clyde .....Bergville
Johnson, Lewis .....Box 238, Albert Lea
Johnson, A. N. .....4512 Drew Ave., Mpls.
Johnson, F. W. .....Breckenridge
Johnson, L. F. ....1014 Bemidji Ave., Bemidji
Johnson, O. H. .....R. 5, Willmar
Johnson, P. J. .....
.....3931 Van Buren St. N. E., Mpls.
Johnson, J. C.....3343 Fillmore St., Mpls.
Johnson, C. J.....Box 37, Cushing
Johnson, L. H. .....Maynard
Johnson, Selmer.812 Zumbro St. W., Rochester
Johnson, F. W.....R. 2, Braham
Johnson, Miss Carolyn .....
.....760 Linwood Place, St. Paul
Johnson, Henry L.....R. 7, Fergus Falls
Johnson, Alphonse E.....R. 2, Stephens
Johnson, Roy.....R. 1, Brandon
Johnson, Geo. .....Grygla
Johnson, N. C. .....
.....South Side Farm, White Bear Lake
Jones, A. C. .....Duluth
Jones, Thos. C. .....Russell
Jordin, Aug.....New London
Jordan, J. J.....Shakopee
Jones, G. P. .....Bagley
Jorgenson Bros. .....Clarkfield
Jungbauer, Frank.1000 Winslow Ave., St. Paul

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Kalbakken, Theo.....St. Joseph, Wis.
Kapler, Geo. R.....Perham
Kasper, Hans.....Grand Marias
Kanges, Henry .....Floodwood
Kalmbach, W. A.....800 Wolvin Bldg., Duluth
Kaminsky, Jos.....Box 445, Hopkins
Kallock, H. H.....Oslo
Keasling, F. J.....Zimmerman
Keith, John A.....Bemidji
Keene, P. L.....Albert Lea

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Ketchum, C. S.....Middlefield, Ohio
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Kenney Dr. D. J.....5153 Penn Ave. So., Mpls.
Keyes, Dr. C. R.....
.....402 N. Central Ave., W. Duluth
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Kimball, Rev. J.....R. No. 1, Duluth
Kinkade, W. S.....Sioux Falls, S. D.
Kinney, S. G.....Faribault
Kirk, Loren O.....716 4th Ave. So., Mpls.
Kirk, E. B.....445 Laurel Ave., St. Paul
Kittson, Norman..1017 Dayton Ave., St. Paul
Kinsman, A. N.....Austin
Kilmers, Northern Nurseries.....
.....1511 Raymond Ave., St. Paul
Killmer, R. E.....Pine City
Kimball, E. L.....119 Anoka St., Duluth
Kidd, Mrs. F. E.....1800 2nd Ave. No., Mpls.
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Klebs, F. W. .....Eagle Bend
Knight, E. W.....
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Knowles, Mrs. M. A.....Excelsior
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Knowles, Miss Marjorie.....
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Knutson, Fred .....Albert Lea
Knapp, A. W.....Mound
Knutson, A. R.....Pelican Rapids
Knudtson, Andrew .....Brandon
Korth, Albert .....Rothsay
Kovar, Wansel .....Owatonna
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Koenig, G. A.....Howard Lake
Korth, Aug. .....Rothsay
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Kroll, John.....Lake Benton
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Kruger, Walter .....Paynesville
Krause, Chas.....Merriam Park
Krogh, H. P.....1502 Hythe St., St. Paul
Kremer, Geo. F.....Grand Rapids
Kroehler, T. J.....Houston
Kraus, Geo. .....McGrath
Kunkel, Jos. J.....Kimball
Kullander, F. O.....Kensington
Kueffner, Otto .....
.....314 New York Life Bldg., St. Paul
Kyrklund, C. H.....Winthrop

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Lamberson, L. .....Warren
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Lade, Halstein .....Fosston
Lake Shores .....Hubbard
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Langord, H. A.....Blackduck
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Landahl, H.....Little Falls
Landeene, W. E.....Elbow Lake
Langmaid, Abbie B..1019 University St., Mpls.
Larson, M. Alfred.....Madison
Landeen, A. F.....Eagle Bend
Lange, Marie R.....Deer River
Larsen, Raymond M.....
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Langlund, Nils .....Cedar Bend
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Lawson, F. E.....Goodhue
Latsch, John A.....Winona
Lawson, M. H.....Ellendale
Lawson, F. L.....Welch
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Lawrence, Mrs. W. W...2108 Woodland Duluth
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Leath, Fred .....Cleveland
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Leary, D. J..... .....Brown Valley
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Lee, Ole N.....Hayfield
Lee, Iver A.....Neilsville
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Leonard, Dr. W. E..408 Donaldson Bldg, Mpls.
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Lindsey, Geo. F. 1413 Mer. Nat. Bk., St. Paul
Linder, E. A.....Warroad
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Lien, Andy, ...Beaudette
Litchscheidl, John ....627 Univ. Ave., St. Paul
Lindhe, H. E.....Deer River
Lindstam, S. F.....St. Louis Park, R. 1
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Lindgren, Oscar.....Princeton, R. 4
Lietze, F. W. .....Mound
Lien, Ole H. .....Willmar
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Loegering, Aug. .....Long Prairie
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Loftman, Oscar .....Fertile
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Logstrom, Reinhold .....Atwater
Loegering, A. J. .....St. Peter
Longfellow, Levi .....208 No. 6th St., Mpls.
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Londeback, F. M.....East Grand Forks

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Lofgren, A. H.....Tower
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Luchan, H. J.....Fertile
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Lunder, H. O. .....Slayton
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Lyness, Chas. E.....New Richland

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Mahler, Adolph.....Waseca
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Malberg, P. B.....Thief River Falls
Mahler, C.....Fairmont, N. D.
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Malmberg, Chas. A.....Lindstrom
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Mailand, C. H.....Newport
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Mayman, E. W.....Sauk Rapids
Mayland, A. W.....Albert Lea
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Mayman, Hattie A.....Sauk Rapids
Mason, Joe.....Long Lake
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Mattocks, Brewer, Jr.,
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Merritt, Neal R.....Hinckley
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Meyer, J. H.....Austin
Meyer, C. H.....774 West Ave., Red Wing
Meyer, Frank.....R. 1, Excelsior
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Meyenburg, H. C.....Montevideo
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Metcalf, Dr. F. W.....Winton
Meyers, J. E.....515 W. 27th St., Mpls.
Miks, Rev. A.....St. Michael
Miller, E. B.....Sta. F, R. 1, Mpls.
Milne, H. A.....R. 2, Elmerado, N. D.
Mighton, S. R.....Bx. 1393, Winnipeg, Man.
Miller, H. J. .....Cologne
Miner, J E.....3022 Dupont So., Mpls.
Mix, H. P.....Lidgerwood, N. D.
Miller, Warren .....Verdi
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Minder, Emma .....Ortonville
Miller, Elbert W. .....R. 1, Anoka
Mills, L. D. .....Garden City
Miller, Hans F. P..501 No. Greeley, Stillwater
Miller, Hans P.....Eagle Bend
Miller, W. L.....152 E. 5th St., St. Paul
Miller, S. J.....Briarcombe Farm, Winona
Miller, Joseph .....Hopkins
Miller, E. .....Amery, Wis.
Miller, Mrs. Sarah A.....Sauk Rapids
Mill., D. L. .....Lake City
Minneapolis Public Library.....Mpls.
Minneapolis Real Estate Board,
633 Andrus Bldg., Mpls.
Minneapolis Architectural Club,
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Hot Springs, Colo.
Moeser, Ed. .....St. Louis Park
Moore, Mrs. C. F.....Worthington
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Mondeng, Chas.
160 Newton Ave. No., Mpls.
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Bradley St. Sta., R. 4, St. Paul
Montgomery, W. C.....R. 3, Excelsior
Moore, John E.....Lewisville
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Moeser, Miss Flora.....St. Louis Park
Molander, A. L.....Bemidji
Moline, Geo. .....Woodstock
Molenar, John.....R. 2, Raymond
Montgomery, R. J.....Weaver
Monk, B. B.....Minot, N. D.
Moen, A. A.....R. 2, Bemidji
Mojha, Joseph.....R. 1, Lonsdale
Moberg, Oscar .....Lowry
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Moris, Mrs. F.....180 Rondo St., St. Paul
Morris, John R.....Beaudette
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Moss, W. F.....Worthington
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Mott, F. R.....Hibbing
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Murray, Chas. M.....Princeton
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Musser, C. R.....Muscatine, Ia.
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Murdock, E. C., 405 Scheffman Bldg., St. Paul
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McAllister College, St. Paul
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McCallum, John.....R. 1, Clinton
McCoy, Dr. Mary.....2127 E. 5th St. Duluth
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McGuire, A. J.....Univ. Farm, St. Paul
McGuire, S. H.....Annandale
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McGolerick, Bishop Jas.....Duluth
McMillan, F. G.....No. 2 5th St. S. E., Mpls.
McLeod, Neil A.....523 3rd Ave. S. E., Mpls.
McLean, Robt. C.....735 Palace Bldg., Mpls.
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McNeil, Mrs. Alex.....Dayton
McQuoid, Jas. .....Pipestone
McPherson, A. K.....Walker

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Neinabor, Chas.....Round Lake
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Nelson, Chas. F.,
1449 Hythe St., St. Anthony Park
Nelson, C. G. .....Lindstrom
Nelson, Hans .....Fergus Falls
Nelson, Hans .....Twin Valley
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Nelson, Hugo C. .....Hibbing
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Nelson, Henry .....Oslo
Nelson, Alf. M.....Hector
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Nelson, Carl A. .....Cokato
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Nolte, Henry .....Duluth
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Nohara, Mathias .....Lonsdale
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Nygaard, Thos.....953 40th Ave. N. E., Mpls.
Nysoen, C. O.....Pelican Rapids

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O'Hair, Dr P.....Waverly
Odland, M. .....Verndale
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Odenburg, Henry C.....Carlton
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Olson, Aug. P. .....Kennedy
Olson, J. B. .....Willmar
Oleson, Michael .....Montevideo
Olson, Mrs. D. W.....White Bear
Olson, Peter M.....R. 4, Zumbrota
Olmstead, R. E.....Excelsior
Olson, O. E. .....Braham
Olson, C. H. .....Beltrami
Olds, L. .....Pequot
Olinger, J. F.....Hopkins
Oldenberg, C. J.....R. 1, Belle Plaine
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Olson, Mrs. Otto W.....Eagle Bend
Olson. Oscar .....Orr
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Olson, S. J.....Grand Meadow
Olson, Oscar A. .....Truman
Olsen, Chesta .....Central
Olson, Paul.....2538 Taylor St. N. E., Mpls.
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Opsata, C. .....Bemidji
Omland, Erik .....McIntosh
Orr, Grier M.....1040 Laurel Ave., St. Paul
O'Neil, Wm.....Cass Lake
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Ottis, Frank J.....867 Forest, St. Paul
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Osborn, H. E.....2900 3rd Ave. So., Mpls.
Osgood, H. E.....757 E. 6th St., St. Paul
Otte, E. W., 821 So. Wabasha St., W. St. Paul
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Overn. A. V. .....Alden

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Palzer, Casper .....Mazeppa
Paine, F. W.....706 Sellwood Bldg., Duluth
Palke, Stepan.....Bryant, Wis.
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Parker, C. W.....Valley River, Man.
Parker, Ira J.....Waverly Hotel, Mpls.
Patten, J. W.....Maple Plain
Paup, F. O.....Sherburn
Paterson, J. F.....South Shore, White Bear
Patterson, M. T.....Ellendale
Peiffer, N. J. Al.....Eden Valley
Pederson, P. A.....Beardsley
Pengilly, Jas.....R. 1, Osseo
Perry, P. H.....Excelsior
Peck, C. M.....Eureka
Pederson, A. W.....Comfrey
Pearson, Hjalmar.....R. 1, Welch
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Peck, Mrs. E. W.....Y. M. C. A., Mpls.

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Peake, G. W.....Univ. Farm, St. Paul
Perkins, T. L.....Red Wing
Perkins, Mrs. W. F.,
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Peck, C. C.....Munsing, Mich.
Pentney, E. H.....Manitou
Peabody, Lloyd.....300 Globe Bldg., St. Paul
Perl, H. J.....1029 Ingehart St., St. Paul
Peck, Harold J.....Deer River
Perkins, Paul H.....250 20th Ave. No., Mpls.
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Peterson, Jos. .....Lake Crystal
Peterson, P. H. .....Atwater
Peterson, C. O. .....Willmar
Peterson, Carl F. .....Storden
Peterson, F. J. .....Waconia
Peterson, O. M. .....Albert Lea
Pew, Fremont C.....R. 5, Mankato
Peterson, Hans P.,
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Peter, Justus..Smith & Annapolis St. St. Paul
Peterson, Jas. .....Blooming Prairie
Peterson, Aug....916 W. Maple St., Stillwater
Peterson, John P. .....Aldrich
Peterson, Chas. J.....R. 2, Burtrum
Peterson, Axel .....Excelsior
Pevey, E. P.....Clearbrook
Petry, Arthur.....930 Hudson, St. Paul
Peterson, Mrs. Martin, R. 2, Kintyre, N. D.
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Peterson, J. H.....Fort Ripley
Peterson, Spurgeon .....Hayfield
Peterson, H. C.....Sleepy Eye
Peterson, Peter .....Deer River
Peters, H. P.....Glenwood
Pfister, J. M.....Marietta
Pfaender, Wm., Jr.....New Ulm
Pfeiffer, C. A.....R. 1, Winona
Pfaender, Walter C.....Univ Farm, St. Paul
Phillips, H.....Fort Williams, West Ont.
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Reynolds, M. N.....Turtle River
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Rodenberg, Henry.....Mindora, Wis.
Rogers, H. N.....Farmington
Rojina, Frank.....Box 72, St. Bonifacius
Roche, Wm.....Inkster, N. D.
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Ruth, S. S.....Deer River
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Rysgaard, Jens....1679 Taylor Ave., St. Paul
Ryan, Geo. L.....No. St. Paul

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Sandboe, I. A.....Wegdahl
Sane, Peter P.....R. 1, Montevideo
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Sauter, A. .....Excelsior
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Sanborn, Louis.....409 Lbr. Exch., Mpls.
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Saxson, C. R.....Worthington
Sandberg, John H.....Pequot
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Schwerin, Henry .....Echo
Scherber, J. D. .....Rogers
Schreiner, Francis X. .....R. 2, W. St. Paul
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Schiffer, Rev. Val .....Madison
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Schrooten, J. .....Fairmont
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Schulcz, Peter .....Wells
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Schnathorst, Wm. .....Frazee
Schultz, L. S. .....Excelsior

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Shattuck, G. W. .....Whalan
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Shelley, T. E. .....Hanska
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Shelland, Miss Annie.....
.....Dept. of Education, Capitol, St. Paul
Sherwood, W. C. .....Woodland Ave., Duluth
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Shenandoah Nurseries .....Shenandoah, Ia.
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Sommers, Benj...628 Fairmount Ave., St. Paul
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Thompson, Harold .....
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Torfin, Iver .....Waunaska
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Va. and Rainy Lake Co.....Virginia
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Vikse, Ole .....Ostrander
Vibert, Percy .....Cloquet
Vincent, V. D.....Commercial Club, Duluth
Vikla, John P.....Lonsdale
Vikla, Wencel J.....Lonsdale
Vollenweider, Henry .....La Crescent
Von Herff, B.....4759 Ingleside Ave., Chicago
Vogler, Henry .....Vergas
Vraspir, Frank.....R. 2, Hopkins

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Waite, Geo. .....Moorhead
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Wallner, Berthold, Jr..200 Dodd Rd., St. Paul
Wallblom, Chas.....1087 Jesse St., St. Paul
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Walz, Theo. .....Watkins
Walkup, J. E.....2416 Sheridan So., Mpls.
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Walters, Wm. .....Grand Portage
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Wallace, John G.....Solway
Watt, John.....Leonard, N. D.
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Washburn, W. O...1082 Summit Ave., St. Paul

Wattner, A. A.....Canby
Washburn, Prof. F. L.....St. Anthony Park
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Warner, Frank .....Snowball
Watts, Arthur.....2833 17th Ave. So., Mpls.
Watt, Wm. .....Swift
Warner, A. L.....2391 Woodland Ave., Duluth
Washburn, C. O.....Edgely, N. D.
Warner, C. E.....R. 1, Osseo
Warner, Mrs. C. E.....R. 1, Bx. 85, Osseo
Wandrie, Otto.....Frazee
Watson, D. H.....Bx. 212, White Bear Lake
Warner, Mrs. E. C.....
.....3030 W. Calhoun Blvd., Mpls.
Warwick, And.....2525 13th Ave. S., Mpls.
Watson, Mrs. J. L.,
1173 Ashland Ave., St. Paul
Wardian, Math. .....Holdingford
Wang, Albert .....118 Park Ave., Duluth
Wands, Robt. W.....Little Falls
Weld, J. O.....1601 Fremont No., Mpls.
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Wedge, Robt. C.....Albert Lea
Weinhagen, Chas. .....361 Bates Ave., St. Paul
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Wedge, A. G., Jr.....Bemidji
Wedge, L. P.....Albert Lea
Wenz, Chas. .....Hector
Weed, Ben B.....
.....Care Weed, Parker & Co., St. Paul
Wegmann, Theo.....Lake Itasca
Webber, Mrs. C. C.....Crystal Bay
Weber, J. A.....Excelsior
Welp, Rev. Francis .....Alexandria
Webber, C. C.....Crystal Bay
Weikert, Henry I.....St. Paul
Wendelschafer, G. T.....Cleveland
Wein, Rev. H. J.....Caledonia
Weld Floral Co., Frank.....Sarcoxie, Mo.
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Westergaard, P. J.....Belgrade
Weyerhauser, F. E.....
.....1413 Mer. Bk. Bldg., St. Paul
West Central School of Agri.....Morris
Wetzel, Aug.....R. 1, St. Ignatius, Mont.
Weyerhauser, C. A.....Little Falls
Wetherbee, M. H.....Charles City, Ia.
West, J. P.....1898 Selby Ave., St. Paul
West, W. J.....Hibbing
West, Wm. L.....43 So. St. Albans St. St. Paul
Werner, H. O.....Agri. College, N. D.
Wetzel, Mrs. Paul K.....Deerwood
Westcott, Geo. E.,
1173 So. Robert St., W. St. Paul
Westerfield, E. O.....Fort Atkinson, Wis.
Westphall, C. D.....R. 2, Romely
Whetstone, Dr. Mary S..738 E. 16th St., Mpls.
Wheeler, Olin, D..N. P. R. R. Office, St. Paul
Whiting, Geo. H.....Yankton, S. D.
Whitney, Geo. G...1731 Summit Ave., St. Paul
Whiting, D. J.....Northfield
Whyte, A.....662 Central Ave., St. Paul
White, J. U.....Brainerd
Whitten, Thos. S.....Winton
Whipple, G. M.....St. Louis Park
White, H. H.....Raymond & Univ., St. Paul
Whitehill, N.....1208 E. 26th St., Mpls.
White, Henry R.....Brainerd
Wickland, John .....Atwater
Widmoyer, W. S.....Dresbach
Wichman, Frank.First Nat. Bk. Bldg., St. Paul
Wickstrom, A. E.....R. 1, Anoka
Width, A. B.....2018 W. Supr. St., Duluth
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Wiggin, G. H.....Cloquet
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Wille, F. W.....1046 Wakefield Ave., St. Paul
Williams, M. .....Staples

Will, O. H.....Bismarck, N. D.
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Wilder, Mark L.....R. 1, Kasota
Wilwerding, Nick.....R. 5, St. Cloud
Willard, D. E.....N. P. R. R., St. Paul
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Wilson, J. F.....Cloquet
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Hydrographic Office, Navy Dept., Wash.
Williams, Rev. E. M.....Northfield
Wilson, H. M.....
.....1116 Harrison St., Superior, Wis.
Willis, R. J.....956 Grand Ave., St. Paul
Wilkus, A. J.....909 Winslow Ave., St. Paul
Williams, L. A.....Pelican Rapids
Wille, Otto L.....110 Bates Ave., St. Paul
Wilson, E. B.....1815 Emerson No., Mpls.
Williams, E. E.....1709 W. 2nd St., Duluth
Williams, Dr. J. P.....3722 E. Lake St., Mpls.
Wilkinson, Mrs. R. J.....Stillwater
Willis, Katon.....Deer River
Wirth, Theo. .....3956 Bryant So., Mpls.
Witte, H. L. F.....R. 3, Hopkins
Wise, H. .....Appleton
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Winter, Douglas .....Long Lake
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Windmiller, Miss Pauline.....Mankato
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Wodny, Jas.....339 4th St., Cloquet
Wolfinger, Jos.....So. St. Paul
Woestehoff, J. C.....Blakeley
Woodward, Philip M.....R. 1, Onamia
Worra, W. N.....Whalan
Wright, Edward..2544 Woodland Ave., Duluth
Wunderlich, Miss Susie.....Bruno, Sask.
Wulfsburg, Einar.....Elbow Lake
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.....5017 3rd Ave. So., Mpls.
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Young, Max M....1777 Marshall Ave., St. Paul

Zuercher, F. .....Excelsior
Zrust, Anthony.....Silver Lake
Zisch, Chas.....Dresbach

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Bowen. Mrs. Jas.....327 Beacon St., Mpls.
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Bush, A. K.....1014 S. E. 7th St., Mpls.

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Cook, Dewain .....Jeffers
Corp, Sidney .....Hammond
Cummins, J. R.....3336 1st Ave. So., Mpls.

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Gardner, Chas. F.....Osage, Ia.

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547 W. Ocean Ave., Long Beach, Cal.
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Ludlow, H. J. .....Worthington
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4304 Scott Terrace, Morningside, Mpls.
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Perkins, T. E.....Red Wing

Redpath, Thos.....Wayzata
Richardson, S. D.....Winnebago

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Tilson, Mrs. Ida E.....West Salem, Wis.

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Underwood, J. M..Point Loma, Roseville, Cal.

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Wheaton, D. T.....Morris
White, Miss Emma V..
3010 Aldrich Ave. S., Mpls.

Life Members.

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Arneson, A. N.....Wegdahl
Arnold, L. B.....24 Butte Ave., Duluth
Aspden, H. H.....Excelsior
Andrews, John K.....Faribault
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Andresen, A. S.....2607 E. 5th St., Duluth
Aamodt, A. W.....Univ. Farm, St. Paul
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Boushka, Frank .....Biscay
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Cashman M. R .....Owatonna
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Carlson, Gust .....care E. C. Gale, Wayzata
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Gale, Ed. C. .....Security Bldg., Mpls.
Gates, A. H.....Rice
Geiger, Wm. C.,
520 W. Van Buren St., Chicago, Ill.
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Gjemse, L. J. .....Cannon Falls
Glaeser, Mrs. Imelda.....Owatonna
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Goebel, Herman .....Stenchfield
Gray, A. N.....Deadwood
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Harris, E. E.....Onalaska, Wis.
Harris, F. I.....LaCrescent
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Harrison, J. F. .....Excelsior
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1020 Chestnut St., Glendale, Cal.
Hawkinson, Chas. .....Excelsior
Hawley, T. C. .....504 E. Elm St., Lodi, Cal.
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Main Office, Register Division, Mpls.
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Ulvik, Hardanger, Norway

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Husser, Henry .....Minneiska
Haakenson, Hjalmar.....Bx. 16, R. 2, Boyd
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7139 Lanham Ave., St. Louis, Mo.

Jager, John.....5241 Upton Ave. So., Mpls.
Jerabek, J. S.....Bx. 46, Silver Lake
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Johnson, A. A. .....Winnebago
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Johnson, Miss Anna M.,
Box 68, R. 1, Lafayette
Johnson, Hans M. .....Pipestone
Jones, S. J.....3736 Oakland Ave., Mpls.
Johanson, J. P. .....Excelsior

Kennedy, J. H.....Sheyenne, N. D.
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Klingel, Rev. Clement,.....St. Anthony, Ind.
Knight, H. G.....LeRoy
Korista, J. S.....Box 172, Hopkins
Krier, T. N.....Farmer, S. D.
Kueker, Wm. .....Faribault
Kurth, Wm. A.....R. 9, Rochester
Krog, Johan P., Jr.,
Pleasant Grove Farm, Lake Benton
Kugler, F. J.....Grand Marias
King, E. C.....Neshkoro, Wis.
Knutsen, Clarence....R. 1, Bx. 200, Hopkins
Krueger, O. F.....3017 Cedar Ave., Mpls.
Krueger, John.....R. 6, Stillwater

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Larson, Lars M.....Faribault
Lien, Thos. J.....Delavan
Lingen, Carl .....Starbuck
Loftnes, A. G.....Thief River Falls
Longyear, E. J.....Excelsior
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Ludescher, J. L.....Frazee
Lund, I. E.....Hopkins
Lundgren, Mrs. E. E....591 Olive St., St. Paul
Lyman, A. B.....Excelsior
Lyndgaard, Jorgen.....Lake Benton
Lyon, Jay F. .....Elkhorn, Wis.
Leding, Edward .....R. 1, Box 64, Gary
Laurence, Jas. G.....Wabasha
Lafot, Ed. W.....Lakefield
Lien, Chas. H.....R. 3, St. Cloud
Lima, Ludwig .....Montevideo
Macauley, T. B.....Montreal, Can.
Mackintosh, Prof. R. S., Univ. Farm, St. Paul
Maher, John W.....Devils Lake, N. D.
Manda, W. A.....Short Hills, N. J.
Mann, W. P.....Dodge Center
Manner, C. J.....Jerome, Idaho
Manning, Warren H.....No. Billerica, Mass.
Marshall, F. F.....R. 1, Grove City
Marso, J. P. .....Canby
Mayo, Dr. C. H.....Rochester
Melgaard, H. L.....Argyle
Melinat, Rev. Max .....Odessa
Miller, Albert.....R. 7, Box 24, Cannon Falls
Mohr, C. J. .....Rapidan
Mo, Hans .....Sleepy Eye
Moorhead, W. W.....Bethany, Mo.
Mosbaek, Ludwig .....Askov
Mueller, Paul L....4845 Bryant Ave. So., Mpls.
Mazey, E. H...2nd Ave. So. and 8th St., Mpls.
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McCulley, Preston .....Maple Plain
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McConnell, Roy E.....St. Cloud

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Nelson, Iver .....Cottonwood
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Norling, A. L.....Elbow Lake
Negstad, A. L.....R. 5, Arlington, S. D.

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Onstine, Frank A.....Harmony
Ortmann, Rev. Anselm.....Richmond, Minn.
Orton, C. J. .....Marietta
O'Callaghan, J. .....Eden Valley
Oyen, O. J.....Watson
Older, F. E.,
State Normal School, Los Angeles, Cal.
Oslund, N. N. .....Cambridge

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Dept. of Agri., Washington, D. C.
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Peterson, Wm. A.,
30 No. La Salle St., Chicago, Ill.
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Pond, I. W.....Madelia
Poore, Hamlin V.....Bird Island
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Perry, A. G.....Care Butler Bros., Mpls.
Prushek, Emil .....Y. M. C. A., Mpls.

Quammen, Ole S.....Lemmon, S. D.

Randall, E. W..315 Commerce Bldg., St. Paul
Rennacker, C. J.....Detroit
Regimbal, L. O.....
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Rood, A. J.....Spring Grove
Rowe, Chas.....R. 3, Excelsior
Ruff, D. W. C.....732 Globe Bldg., St. Paul
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Raymond, E. A.....Wayzata
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Rockhill, Harlow, ...Conrad, Ia.

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Sayre, A. M.....Hills
Schaupp, Chas. F.....Rushford
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1203 Farnham St., Omaha, Nebr.
Schell, Otto.....New Ulm
Schuster, Ed. W.....Crookston
Schmidt, Dr. G.....Lake City
Scott, Rev. W. T.....Black River Falls, Wis.
Scranton, Ellsworth .....Montrose
Scbenius, John Uno.....Wolvin Bldg., Duluth
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Skaar, N. O.....Zumbrota
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Slocum, A. M.....Excelsior
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Smith, E. A.....Lake City
Snyder, Harry.....1800 Summit Ave., Mpls.
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Spencer, N. V.....Park Rapids
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St. John, B. E.....Bruce, Wis.
Strand, G. W.....Taylors Falls
Swanson, Aug. S.....Wayzata
Swanson, J. H.....St. James
Swennes, Knute, ...Minneota
Skotterud, E. O.....Dawson
Stevenson, M. J.....Morris, Man.
Sanders, T. A.....c-o Butler Bros., Mpls.
Scherf, F. A.....(Courthouse) Red Wing
Swanson, Law.....205 Maria Ave., St. Paul
Sparre, Erick.....Elk River
Shogren, Fred M.....Popple
Schneider, Rudolph C.,
708 Osceola Ave., St. Paul
Score, John J.....Bucyrus, N. D.

Tanner, Wm. .....Cannon Falls
Teigen, Geo. .....Dooley, Mont.
Teigland, J. L.....Minneota
Terry, Alfred .....Slayton
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Todd, Fred G., 10 Phillips Pl., Montreal, P. Q.
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Treimen, J. P.....Miller, Mont.
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True, Fred O.....R. 1, Good Thunder
Turngren, L. E.....Montrose

Tonder, Sam.....R. 2, Wabasha
Torgeson, T.,
c-o, Prairie Nurseries, Estevan, Sask.
Tollberg, O. Edwin.....Winner

Underwood, Roy D.....Lake City

Van Antwerp, Edward, ...Geddes, S. D.
Van Nest, R. A.....Windom
Voight, L. H.....Hastings
Volstad, Hon. A. J.....Granite Falls

Wagner, J. F.....Bx. 13, California, Mo.
Waldron, L. R.....Agri. College, N. D.
Warren, Geo. H.....3443 Irving So., Mpls.
Warren, W. T.....Slayton
Webster, Mrs. W. F..1025 S. E. 5th St., Mpls.
Wendlandt, Wm.....R. 5, Owatonna
Wentzel, A. E.....Crookston
Wentzel, Louie .....Crookston
Wentzel, Wm. F.....Crookston
Weston, W. S.....Faribault
Wheeler, C. F.....Excelsior
White, J. C.....Mabel
Williams, J. G.....931 Endicott St., Duluth
Williams, M. M.....Little Falls
Wilson, Harold S.....Bx. 71, Monroe, N. Y.
Wise, Geo. A.....
Wright, R. A.....Excelsior
Webster, D. C.....La Crescent
Wiehe, C. F.....1520 Jackson Blvd., Chicago
Wyman, Willis L.....Park Rapids
Woods, A. F.....College Park, Md.
Wellington, R.....Univ. Farm, St. Paul
Wales, C. E..601 N. W. Nat. Bk. Bldg., Mpls.
Ward, F. A.....119 4th Ave. So., St. Cloud
Wittig, W. W.....Wyoming
Weiss, Freeman.....1602 No. Fremont, Mpls.
Warren, O. B.....Hibbing
Wright, A V.....Mine Center, Ont.
Wallace, H. L.....Grasston
Wister, John C.,
Wister St. & Clarkson Ave., Philadelphia, Pa.
Wolner, Dr. O. H.....Gilbert
Wermerkirchen, Rev. Father A.....Hokah
Wheeler, Gerda .....Bruno
Willson, F. K..Linden Hills Sta., R. 2, Mpls.

Yanish, Edward.....Bx. 262, St. Paul
Yost, John L.....Murdock

Zeimetz, Thos. H.....Wabasha
Zabel, E. G.....Deer Creek

Life Members Deceased in 1917.

L. R. Moyer.....Montevideo
Oliver Gibbs .....Melbourne Beach, Fla.
S. H. Kenney.....Waterville
A. J. Philips.....West Salem, Wis.
A. H. Reed.....Glencoe

List of Members, 1917, Minnesota Garden Flower Society.

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Hotel Leamington, Minneapolis
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1285 Portland Ave., St. Paul
Anderson, Wm.....1540 Kerwin St., St. Paul

Baker, Miss Ida A.,
4629 Lake Harriet Bvld., Minneapolis
Baker, Harry Franklin,
4629 Lake Harriet Bvld., Minneapolis
Bailey, Mrs. W. C.,
1023 17th Ave. S. E., Minneapolis
Barrett, Miss Alice,
2735 Humboldt Ave. S., Minneapolis
Bartram, Mrs. C. S.,
R. F. D. No. 1, White Bear
Bass, Mrs. G. Willis,
1811 Bryant Ave. N., Minneapolis
Beckman, Mrs. A.,
3922 Tyler St. N. E., Minneapolis
Beeman, Mrs. W. L.,
2364 Buford Ave., St. Anthony Park
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Bird, Miss Beatrice A..R. R. 2 Hopkins, Minn.
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Blodgett, Mrs. H. A.,
856 Fairmont Ave., St. Paul
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Bofferding, Mr. W. H.,
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251 Chamber of Com. Annex, Minneapolis
Brown, Mrs. G. T....646 Hague Ave., St. Paul
Brown, Mrs. G. W.....St. Louis Park, Minn.
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Cady, Prof. LeRoy,
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Chadbourn, Mrs. R. W.,
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Chamberlin, Mrs. A. B.,
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Chapman, Miss Evangeline,
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Chatfield, Mrs. E. C.....Mound, Minn.
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1980 Montreal Ave., St. Paul
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